Railway Age Gazette

SECOND HALF OF 1916—No. 15. SIXTY-FIRST YEAR

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CHICAGO: Transportation Building

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Railway Age Gazette

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*Illustrated.

In quite a considerable number of annual reports of railroad presidents in the last two years mention has been made of inroads which automobiles are making on railroad passenger business. There is another aspect, however, of the development of the automobile and automobile truck which may turn out to be of considerable advantage to railroad development. The use of the automobile and the automobile truck is acting as a preventative of branch line railroad building, thus conserving capital for betterments to existing lines. A good road is built by the state or county and this road, with the development of the automobile truck, acts as a feeder for the railroads which it crosses and, moreover, a feeder built with the public's capital and not the railroad company's capital. Unprofitable branch line mileage has been the old man of the sea on the back of many a railroad in this country. A good state or county road crossing a railroad will be a feeder to it for 40 to 50 miles on either side of the track. At the present time there are many rural communities which are sending freight and passengers over 40 miles or more of good road to the nearest railroad by automobile—as much traffic as the railroad could hope to get over a branch line, the interest charges on which would be great enough to eat up nearly all the profit on the line haul.

Automobiles as Preventatives of Railroad Building

One outstanding feature of the annual track inspection of the Pennsylvania Railroad, described elsewhere in these columns, is the spirit of friendly rivalry shown by the rank and file of the maintenance forces. As the date of the inspection implies, the inspection trip was made after the summer's work had been completed and the track brought up to its best condition in preparation for the winter. It is apparent that the knowledge that its work is to be inspected causes each section gang to make an especial effort to have conditions on its individual section not only equal to, but better than those obtaining on other sections. The results of this rivalry are evinced in the present condition of the track and structures. Notwithstanding the difficulties that attended the carrying out of the season's program, caused by the great increase in traffic, the difficulty in obtaining materials and the labor shortage, it is the opinion of the higher officers that the tracks and structures were never in better condition.

The Pennsylvania Annual Track Inspection

The convention of the Chief Interchange Car Inspectors' and Car Foremen's Association, held at Indianapolis, Ind., last week, proved extraordinarily successful. At previous conventions practically all of the time has been given to the discussion of changes in the interchange rules with a view to securing a correct and uniform interpretation. This year it was not necessary to use all of the time for this purpose and, as will be noted from the report of the meeting, a number of individual papers were read relating to car department problems. This added greatly to the interest and value of the meeting and seemed to be appreciated by all of the unusually large number of members in attendance. Another innovation which was well received was the presentation of the papers in the prize competition on Car Department Apprenticeship and the announcement of the winners. This association, composed of interchange and car inspectors and car foremen who are necessarily in intimate touch with the practical detail problems of the department, should prove a most valuable adjunct to the Master Car Builders' Association and a close second to it. Judging from the forward stride which it has taken during the past year its members are fully awake as to these possibilities and intend to make the most of them.

Car Department Convention

Nearly every receiver of freight on a large scale has a bunch of grievances, or memories of grievances, against the railroads, because of delays to important shipments, and the railroad agent who has to deal with such receivers has to do a good deal of explaining, of course; many people seem never to realize the impossibility of moving all freight at express speed, and this need of explaining will never end. A perusal of the numerous printed circulars which the railroads everywhere have lately sent to shippers, appealing for prompt loading and unload-

Economizing with Freight Cars

ing of cars, brings this point to mind; for they are uniformly silent concerning it. The Interstate Commerce Commission's appeal looks at both sides of the question, but that appeal is so mild and general that, by itself, it will not arouse anybody. Of course, the railroad officer does not ignore his own part in the problem of averting a car famine, but in his circulars he seems to ignore it. The psychologists tell us that it is well, in many situations, to acknowledge even some faults of which we are not guilty; psychology might be an aid in this matter. Two of these circulars bring out points not usually touched upon. That of the Delaware & Hudson (which is notable for its excellent typography and arrangement) reminds consignees that holding a car overnight with a small quantity of freight—perhaps the last ton—may use up a whole day. It is to be hoped that the teamsters' union will not thwart this suggestion by refusing to work a few minutes after union hours to finish unloading a car. The Texas & Pacific takes the shippers into its confidence, in a practical way, as follows:

> Quite a large percentage of the Texas & Pacific loading goes beyond our rails. We must receive from our connections empties to take the place of these loads in order to keep a supply. That we may secure the largest number of empties in exchange for these loads, it is necessary that the routing beyond the Texas & Pacific rails (except destination delivery) be left open, thus giving us a chance to deliver loads to such of our connections as will give us the most empties for your benefit. Can we depend upon you for this assistance?

To the congressman, jealous of the "rights of the people," this may seem to be a very irregular proposal. To give away the right to route your freight will be looked upon as a dangerous concession. But the proposed arrangement will promote true reciprocity, and, no doubt, conduce to the most expeditious movement of all freight. And, as suggested in the latter part of the paragraph, this will be to the advantage of shippers as well as carriers.

MORE ABOUT THE CAR SITUATION

ALTHOUGH from the standpoint of statistics the car situation today is no more encouraging than it was early last spring when the eastern freight accumulation conference was called and demurrage rates were temporarily increased, railways and shippers seem less perturbed and business not so adversely affected as at that time. Embargoes at the eastern ports are placed with less frequency and although shippers in general are clamoring for cars, little complaint as yet has been heard from consignees. It is nevertheless a fact that the eastern roads now have in their possession about 100,000 cars more than they own, and that the carriers in the rest of the country are having difficulty in handling an unprecedented business with less than normal equipment. There is a severe shortage of box cars in the granger states, of coal and box cars in the territory of the Central Freight Association, of box cars in the South and Southwest, and of coal cars in the East. The railroads, the Interstate Commerce Commission and various state commissions, as well as organizations of the shippers, have issued circulars urging co-operation to the end that equipment be kept circulating as rapidly as possible. State commissions likewise have called hearings with a view of determining ways and means of further alleviating the car shortage.

How much more serious the car situation will become is, of course, a matter of conjecture. Unquestionably both the railroads and the shippers gained much valuable experience during the early part of the year which is of service to them at the present time. Mild weather during the remainder of the fall would do much to facilitate the movement of cars. In some respects the grain movement this year constitutes less of a spectre to railroad men than it did last year, when the crops were unusually heavy and matured late on account of an extended period of rain. The United States Department of Agriculture estimates the yield of winter and spring wheat for 1916 at approximately 600,000,000 bu., as compared with an estimated yield of 1,000,000,000 bu. for last year. The oat crop for 1916 is estimated at 1,230,000,000 bu., as compared with 1,540,000,000 bu. for 1915, and the barley crop for 1916 is estimated at 184,000,000 bu., as against 237,000,000 bu. for 1915. Not only is the yield of grain far short of what it was last year, but the movement of grain started earlier this year than in 1915.

The following table shows the receipts and shipments of oats and wheat to and from western storage centers and ocean ports of the United States, from July 1, to September 30, 1916, inclusive, as compared with the same period in 1915:

RECEIPTS AND SHIPMENTS OF WHEAT AND OATS IN JULY, AUGUST AND SEPTEMBER, 1915 AND 1916

	Wheat		Oats	
Received (bu.)—	1916	1915	1916	1915
Western Points	135,000,000	118,000,000	113,000,000	79,000,000
Seaboard Cities	82,000,000	47,000,000	43,000,000	27,000,000
Shipped (bu.)—				
Western Points	82,000,000	75,000,000	69,000,000	57,000,000
Seaboard Cities	69,000,000	39,000,000	39,000,000	20,000,000

The great corn movement will not begin until spring, and therefore does not concern us in considering the immediate future. Government forecasts of the corn crop, however, indicate that the yield for 1916 will fall short of that of the previous year by about 300,000,000 bu. More than the usual amount of corn may be kept on the farms this year for feeding purposes because of the high prices of cattle and hogs.

In spite of the small crops and the early beginning of the grain movement, the elevators in the middle western storage centers and at the ocean ports are filled to capacity and thousands of grain cars crowd the sidings of these points waiting to be unloaded. The prices of wheat, corn, and rye are the highest in history, with the result that there is a general clamor for cars. The carriers are moving grain as fast as equipment, elevator capacity and ships can handle it. The lack of enough ocean going vessels to take grain from the elevators as fast as it is ready for shipment is largely responsible for the slowness of the movement. The Great Lakes freighters, sold by the railroads under compulsion, have not been available to aid in carrying grain to the East. A negligible tonnage of grain has been shipped from Chicago to Buffalo via water this year, whereas formerly approximately 25 per cent of the total grain shipments from Chicago took the water route. The carriers, who protested against the sale of their lake lines, surely are not to be blamed if their boats have left the lakes or are now engaged in the transportation of other freight for their present owners.

Although the problem confronting transportation officials is a difficult one, according to records of past years we may anticipate a slackening in the demand for cars in the early part of November. In the meantime the trend of traffic continues to be towards the East, and the number of western cars in that territory continues to increase with resultant embarrassment to the originating roads. Car congestion in the East is due rather to the tremendous increase in business activity than to a lack of shipping facilities, as is generally supposed. Our exports for the first seven months of 1916 were 2,926,000,000 tons, as compared with 1,970,000,000 tons for 1915, and 1,201,000,000 tons for a corresponding period in 1914. The great war has transformed the entire territory east of Chicago and north of the Ohio, extending to the seaboard, into one vast workshop. Factories and cities have sprung up where nothing existed before the war. Business has increased faster than the manufacturer's ability to increase his facilities for handling it, with the result that sidings overflow with cars, and cars are received faster than they can be disposed of, resulting in a general accumulation which impedes traffic throughout the entire territory.

It is thought by some, that not only the West and South, but the East itself would be benefited by the voluntary return of cars to the originating roads. No doubt the East needs all the cars that it now has and many more, but it

lacks sufficient trackage and adequate loading and unloading facilities. If some of the western and southern cars were sent to the home roads the circulation of equipment in the East, which is now hampered by the congestion at terminals and at manufacturing centers, would accelerate, to the advantage of both shipper and carrier. An increase in the per diem rate on cars has been suggested as a means of effecting the return of equipment to the home roads.

Although freight cars are obviously designed for transportation purposes, there are still many shippers who find it economical to use them for storage purposes. As long as this is true there is need for a revision of the demurrage rules. No time is better suited to such a reform than the present, when necessity dictates that every means be used to increase the circulation of equipment.

BROTHERHOOD JOURNALS PLEASE COPY

A REPORT of the public hearing before the Senate Committee on Interstate Commerce on August 31 in connection with legislation relative to the threatened strike of railway employees, has just been issued from the government printing office, having been held up nearly a month for corrections since a tentative report was issued on the morning following the hearing. A large number of corrections have been made in the report and some additional matter has been inserted, but there is a slight error which was not corrected, to which we feel we ought to call attention, in view of the great interest in this document and the wide circulation it is being given by the brotherhoods, who have had some 400,000 copies printed for distribution among their members.

A. B. Garretson, president of the Order of Railway Conductors, was giving the committee some information regarding railway wages and salaries to guide it in its efforts to determine whether the members of the brotherhood should receive an increase in wages. He said that the total annual payroll of the railways is $1,381,000,000, and he divided it as follows:

"There are 309,000 trainmen accounted for there and they get $387,000,000. The clerical force amounts to 300,000 and they get $216,000,000. All the other employees of the railways, except the official force, get $413,000,000. There are only 52,000 railway officials on this continent. They get $364,000,000 and they do not cut it down and give it to this 80 per cent that are so illy paid. Their average is $7,000 and over half of them do not draw any more money than passenger conductors. So you see that it raises those that are above the average. Charity does not begin at home."

The *Railway Age Gazette,* in its issue for September 22, page 483, published an editorial entitled "More Lies About Railway Salaries." This was devoted to comment on an article which recently was published in the American Railway Employees' Journal. Mr. Garretson's statements are, if possible, more preposterously false than those which we quoted from the Railway Employees' Journal. The fact that they come from the chief spokesman of the labor brotherhoods indicates either an amount of ignorance on the part of the labor leaders that is beyond comprehension or a deliberate attempt by them to mislead their followers and the American public. We believe it is the latter.

The statistics of the Interstate Commerce Commission are the only source available from which to get correct figures regarding the wages and salaries of all classes of railway officers and employees, and these statistics demonstrate the falsity of Mr. Garretson's statements. Mr. Garretson gives the total compensation paid annually to officers and employees as $1,381,000,000. This figure is from the commission's statistics for the year ended June 30, 1914, "Statement No. 24," page 29. In exactly the same statement appear the statistics regarding the total compensation paid to all the eighteen classes into which the commission divides officers and employees, including "general officers," "other officers," "general office clerks," etc. On page 26 of the same volume, in "Statement No. 21," are given the numbers of the officers and employees of all the various classes.

Mr. Garretson ignores all these statistics, and gives figures which are absolutely fictitious. He says, "the clerical force amounts to 300,000, and they get $216,000,000." According to the Interstate Commerce Commission there are 87,106 general office clerks, and they receive $75,429,665. Mr. Garretson says, "There are only 52,000 railway officials on this continent. They get $364,000,000." Mr. Garretson certainly doesn't care what he says! The Interstate Commerce Commission's statistics show that there were in 1914 only 5,740 general officers of the railways, and that their total compensation was only $21,338,995. There were only 11,153 other officers, who received $24,247,155. The average salary of the general officers was, therefore, only $3,717 a year. The average for the other officers was only $2,174 a year. The total salaries of all of the officers of all of the railways amounted to a little over $45,000,000, or $319,000,000 less than Mr. Garretson's total, and the average was $2,106, which is not much more than the passenger conductors receive.

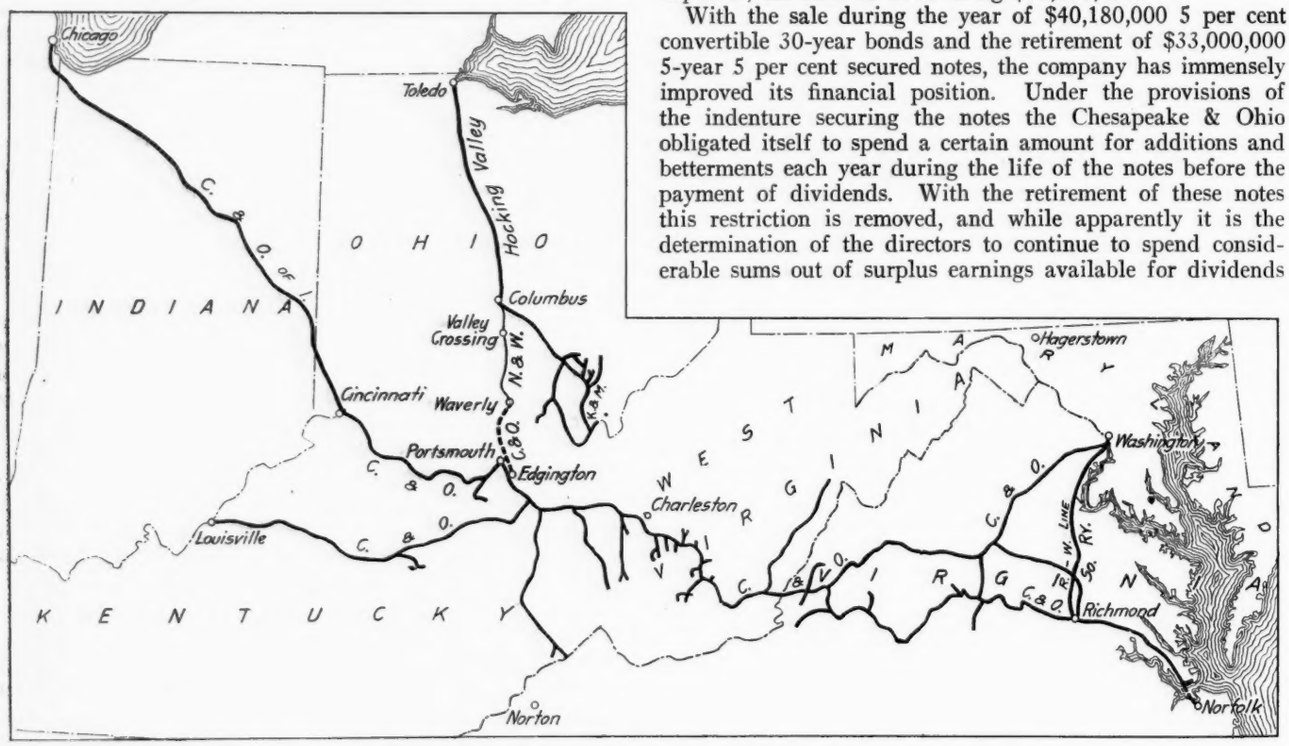
We note that Mr. Garretson or someone has made some corrections in the language of this paragraph because the tentative print quoted him as saying that "very few" of the officers draw less than $7,000, but he has let the figures stand. In view of the fact that the conductors were about to receive an increase in pay of about 21 per cent, possibly Mr. Garretson felt rather liberal at the time, but he should not be so careless with other people's money, especially as some of the 400,000 brotherhood members who read it may become envious of the pay received by their officers and may again feel difficulty in restraining the "primal instincts" which Mr. Garretson said had impelled them to threaten a strike on that occasion. At any rate, they should recall that the officers, although some of them receive more money than the train employees, have not yet been able to persuade Congress to give them the eight-hour day, and that many of them are under responsibility during the full twenty-four hours. As some of the members of the brotherhoods who will be misled by Mr. Garretson's carelessness are not regular readers of the *Railway Age Gazette,* we trust that if the editors of the brotherhood journals, who sometimes do read it, will call this slight additional correction to their attention in their own columns, it may prevent some heartburnings and other primal instincts.

CHESAPEAKE & OHIO

THE Chesapeake & Ohio is the only railroad in the United States operating over 2,000 miles of road that has an average revenue trainload of more than 1,000 tons. In the fiscal year ended June 30, 1916, the average revenue trainload was 1,003 tons, an increase of 97 tons over the average in the previous year. This index of operating efficiency should be kept in mind in studying the financial results which were obtained last year.

The Chesapeake & Ohio earned in the fiscal year ended June 30, 1916, 10.96 per cent income available for dividends on its outstanding $62,793,000 common stock. This is better even than the best previous record made in 1910 when 10.02 per cent was earned. A very heavy increase in shipments of bituminous coal accounts in large part for the increase in gross earnings in 1916 as compared with 1915. The total tonnage of all freight carried in 1916 was 37,620,000, an increase over 1915 of 7,571,000 tons. The total tonnage of bituminous coal carried in 1916 was 26,494,000, an increase over the previous year of 5,384,000 tons. Industrial activity and prosperity and extraordinary heavy exports of coal due to war conditions are the explanation of the greater part of the increase last year as compared with the year before. Extraordinarily heavy movement of traffic due to these causes is to a certain extent temporary, but it may well be that the gains made in coal traffic can be held in another way.

The Chesapeake & Ohio Northern is the name under which the Chesapeake & Ohio is building a line from Limeville, Ky., on the main line, to Waverly, Ohio, on the Norfolk & Western, 30 miles. This line is nearly completed and it is expected that it will be in operation in time to handle the coal shipments for the Great Lakes at the opening of navigation in 1917. The Chesapeake & Ohio has completed arrangements for trackage rights over the Norfolk & Western from Waverly to Valley Crossing, near Columbus, on the Hocking Valley. A majority of the Hocking Valley stock was bought by the Chesapeake & Ohio in 1910. As an investment pure and simple, this purchase of the Hocking Valley was a profitable one. Up to the present, however, it has failed to serve to the full the other purpose back of the purchase, namely, to provide a means for the shipment of coal originating on the Chesapeake & Ohio north to the lakes by a route which would give the Chesapeake & Ohio a profitable division of the through rate. The Chesapeake & Ohio had a half interest in the Kanawha & Michigan



The Chesapeake & Ohio and the Hocking Valley

which gave it its connection with the Hocking Valley, but the haul was so short on the Chesapeake & Ohio and the Kanawha & Michigan's share of the through rate so great, that there was little, if any, profit directly to the the Chesapeake & Ohio on coal business originating on its lines and moving via this route to the Great Lakes. With the opening of the Chesapeake & Ohio Northern the Chesapeake & Ohio will get the full haul from the coal fields to Waverly, Ohio, on the Hocking Valley, out of the rate for which it will have to pay only the trackage rental to the Norfolk & Western for use of that company's line from Waverly to Valley Crossing, 61 miles. The opening of this Chesapeake & Ohio Northern line will therefore be of very considerable importance in permanently increasing the Chesapeake & Ohio's coal traffic. A satisfactory outlet to the lakes has been badly needed for a fuller development of what is potentially a very profitable business for the Chesapeake & Ohio.

With operating revenues amounting to $48,239,000 in 1916, an increase over the previous year of $8,775,000, the company had total operating expenses of $31,789,000, an increase of $4,233,000. The increase in revenues amounted to 22.2 per cent and in expenses to 15.4 per cent. More than half of the increase in expenses, however, was in maintenance of equipment. It is pretty safe to say that the Chesapeake & Ohio has in the past few years been hampered by a lack of rolling stock and of locomotives best adapted to the operating needs of the property. It may be that in 1915 maintenance of equipment expenditures were held down almost too rigidly, necessitating expenditures in 1916 that were in the nature of getting back to a higher standard. With the purchase of 34 locomotives and 4,138 freight cars, and with the very large expenditures for maintenance of equipment, the Chesapeake & Ohio has presumably gone a long way toward greatly improving its equipment situation. The remarkably good showing in train loading testifies to the success of these efforts.

With an increase of 26.5 per cent in the ton mileage of revenue freight—the total in 1916 was 10,296,500,000—there was an increase of only 7.1 per cent in transportation expenses, the total in 1916 being $13,810,000.

With the sale during the year of $40,180,000 5 per cent convertible 30-year bonds and the retirement of $33,000,000 5-year 5 per cent secured notes, the company has immensely improved its financial position. Under the provisions of the indenture securing the notes the Chesapeake & Ohio obligated itself to spend a certain amount for additions and betterments each year during the life of the notes before the payment of dividends. With the retirement of these notes this restriction is removed, and while apparently it is the determination of the directors to continue to spend considerable sums out of surplus earnings available for dividends for additions and betterments, the fact that this is a voluntarily adopted policy and not a restriction on the free action of the board, of itself is an improvement to the company's credit.

In the fiscal year ended June 30, 1916, there was a surplus available for dividends of $6,879,000. All of this was transferred to profit and loss and by so much increased the assets of the company without the issue of any securities. The total discount and expenses in connection with the bond issue and taking up of the notes was charged to profit and loss, necessitating a debit of $2,814,805. At the end of the year there was $7,005,000 free cash on hand and no loans and bills payable, except a nominal $95,000 coming under this head.

It may be recalled that the Chesapeake & Ohio was required to make refunds under the West Virginia two-cent fare law of excess fares collected during the testing of the constitutionality of the law. Apparently about all of these refunds have now been paid, there being less than three thousand dollars paid on this account in 1916.

Since 1909, when the present management took the Chesapeake & Ohio, a total of $153,444,000 par value of securities has been issued or assumed. The company realized $145,429,000 from the sale of these securities and with this money paid off $84,719,000 of securities, leaving net $60,710,000 with which the management bought the stock of the Chesapeake & Ohio of Indiana (the Chicago line), the majority stock of the Hocking Valley, the stock of the White Sulphur Springs, Inc. (new Greenbriar Hotel), and the stock of the Chesapeake & Ohio Northern, beside various other smaller blocks of stock of subsidiaries, at a total cost of $20,929,000; bought bonds of subsidiaries at a total cost of $6,717,000; bought outright the Coal River Railway, the Raleigh & Southwestern and the Virginia Air Line at a total cost of $4,193,000; and spent for additions and betterments to property $18,084,000, and additional equipment, less retirals, $19,849,000. This is a total of $69,773,000. In other words, during the last seven years approximately $9,000,000 of stockholders' money has been invested in additional assets.

The statement of which the above paragraph is an abstract is given in the Chesapeake & Ohio annual report in a form that is unique among American railroad companies. The form of the statement is simple and intelligible to the layman and is an admirable recognition of the duty which rests on a board of directors to give to their stockholders a simple, understandable account of their stewardship of the stockholders' property.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	2,375	2,369
Freight revenue	$39,079,087	$31,288,537
Passenger revenue	5,998,044	5,696,088
Total operating revenues	48,239,012	39,464,037
Maintenance of way and structures	5,553,447	4,694,522
Maintenance of equipment	10,561,094	8,234,170
Traffic expenses	645,189	650,407
Transportation expenses	13,809,686	12,896,079
General expenses	953,685	873,883
Total operating expenses	31,789,179	27,556,414
Taxes	1,587,407	1,349,497
Operating income	14,842,218	10,549,914
Gross income	16,023,752	11,568,133
Net income	6,879,216	2,663,537

ILLINOIS CENTRAL

THE Illinois Central has perfomed the rather remarkable feat of making a substantial reduction in transportation expenses in the fiscal year ended June 30, 1916, as compared with the previous fiscal year. Operating revenues were the largest in the history of the company—$69,077,000, or 11.21 per cent more than in 1915. The ton-mile rate was the lowest in the history of the company—5.46 mills, comparing with 5.48 mills in 1915, the previous low rate. The achievement of reducing the ratio of transportation expenses to total operating expenses from 35.77 in 1915 to 31.62 in 1916 was accomplished by the substitution of 48 Mikado locomotives for 72 smaller locomotives retired; by better supervision of train movement, and by a very successful campaign of fuel economy and of attention to loss and damage and other claims. The new Mikados were equipped with superheaters, and superheaters were put on one Atlantic type and two Pacific type passenger locomotives.

The result of the betterment in available power is striking. The ton mileage of all freight carried was 8,514,500,000 in 1916 as compared with 7,522,100,000 in 1915, an increase of 992,400,000, or 13 per cent. The average length of haul was about the same—243 miles in 1916 and 240 miles in 1915. The mileage of revenue freight trains decreased by 2.14 per cent. The mileage of helping and light freight locomotives decreased by 20.13 per cent. The average trainload of all freight was 595 tons in 1916 as against 523 tons in 1915. The tons of all freight per revenue service locomotive-mile, excluding switching miles, was 582 tons in 1916, comparing with 509 tons in 1915.

The increase in trainload was helped by a better balanced traffic, loaded freight car mileage increasing by 12.63 per cent, with empty car mileage increasing only by 2.39 per cent. The average loading per loaded car, however, was not quite so good in 1916 as in 1915, being 23.80 tons and 24.09 tons respectively. The principal increase in freight traffic was in the tonnage of bituminous coal handled. This amounted to 14,065,000 tons in 1916, or 40.16 per cent of the total tonnage carried, and to 12,389,000 tons in 1915, or 39.57 per cent of the total tonnage carried in 1915.

The Illinois Central had hard sledding from 1911 up to the last half of 1915, through no fault of its management, but because of strikes, washouts and other unfortunate occurrences which could not be guarded against. Even in the fiscal year ended June 30, 1916, one of the factors which added considerably to the revenues of the Atchison, Topeka & Santa Fe and the Southern Pacific—the fact that the Panama canal was closed—probably took away from the Illinois Central's revenue. There is evidence in this year's annual report to show that up to the time of the arrival of the new Mikados the Illinois Central's locomotive situation had never quite recovered from the effects of the shopmen's strike four years ago. In 1911 the Illinois Central was in magnificent physical condition. The strike and the floods since necessitated very heavy maintenance expenditures, and in this connection the Illinois Central management wisely spent considerable sums for additions and betterments, even when new capital was mighty hard to get. The result of this policy was quite suddenly shown up when the locomotives necessary to make a fuller utilization of the plant were bought.

In 1916 there was a total of $6,098,000 spent for additions and betterments to road and equipment, of which approximately $2,400,000 was for equipment covered by equipment trust certificates. There was a credit of $481,000 for steam locomotives retired and $448,000 for freight cars retired. Additions and betterments include the installation of 294 track-miles of electric block signals, there being 452 miles additional now in process of installation. When this work is completed the entire railroad from Chicago to New Orleans will be block signaled. An engine house, car shop, washout plant, office and turntable were built at Dyersburg, Tenn., and a 10-stall roundhouse and 85-ft. turntable, etc., put in at Jackson, Tenn., and improvements were made to mechanical facilities at Freeport, Ill.; Waterloo, Iowa; Ft. Dodge, Iowa; Cherokee, Iowa, and Nonconnah yard, at Memphis. New mechanical coaling stations were built at three points in Illinois and at one point in Iowa and one point in Kentucky.

Maintenance of way expenses were affected by the cost of restoring tracks and bridges damaged by a tornado and high water near New Orleans in October, 1915, and also by higher rates of pay to section men. The total spent for maintenance of way and structures in 1916 was $9,507,000, an increase of $640,000 over the previous year. Maintenance of equipment expenses were abnormally high because of extraordinarily heavy charges for repairs, depreciation and retirement of freight cars. The total spent for maintenance of equipment was $16,548,000, or $2,604,000—18.67 per cent—more than in the previous year.

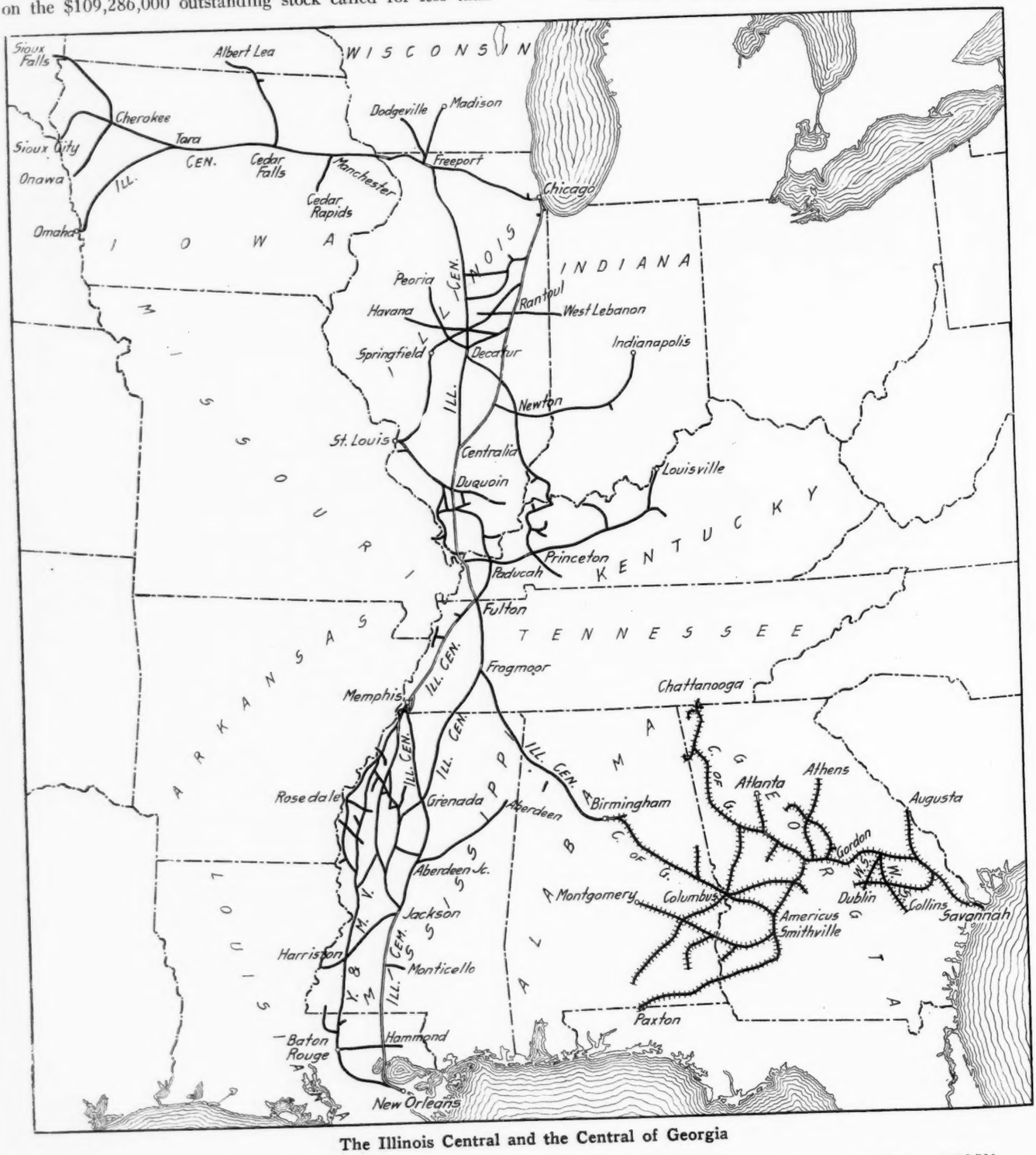
Mention should be made of the fact that the Central Fruit Despatch, which was organized in 1912 to take over the refrigerator service business of the Illinois Central, has proved unprofitable. The operations of this subsidiary were discontinued on September 1, 1914, and the Illinois Central accepted and took into its profit and loss account a loss of $547,000 on the venture.

Notwithstanding the heavy maintenance expenses, the financial results of the year's operations are more nearly like those of the Illinois Central before it ran into its streak of hard luck in 1912. Total operating revenues in 1916

amounted to $69,077,000, an increase of 11.21 per cent over 1915. Notwithstanding an increase in taxes of $490,000, operating income amounted to $14,155,000, an increase of $3,277,000 over 1915. After paying interest charges there was available for dividends $11,655,000, or $4,949,000 more than was available in 1915. The 5 per cent dividends on the $109,286,000 outstanding stock called for less than half of the amount available for dividends in 1916. The only securities sold during the year were $1,900,000 equipment trust certificates. At the end of the year there was $5,638,000 cash on hand, an increase of $3,052,000 over the previous year, and no loans and bills payable, the bills payable of $1,000,000 outstanding at the beginning of the year having been paid off.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated	4,767	4,770
Freight revenue	$50,045,039	$44,446,222
Passenger revenue	13,582,092	12,851,677
Total operating revenues	69,077,343	62,111,552
Maintenance of way and structures	9,506,527	8,866,250
Maintenance of equipment	16,547,749	13,943,804
Traffic expenses	1,252,366	1,238,732
Transportation expenses	21,841,050	22,217,903
General expenses	1,763,356	1,655,794
Total operating expenses	51,173,728	47,975,197
Taxes	3,724,021	3,233,838
Operating income	14,155,087	10,878,473
Gross income	23,775,831	18,837,300
Net income	11,807,565	6,859,162
Appropriations	152,932	153,903
Dividends	5,464,800	5,464,800
Surplus	6,189,833	1,240,459



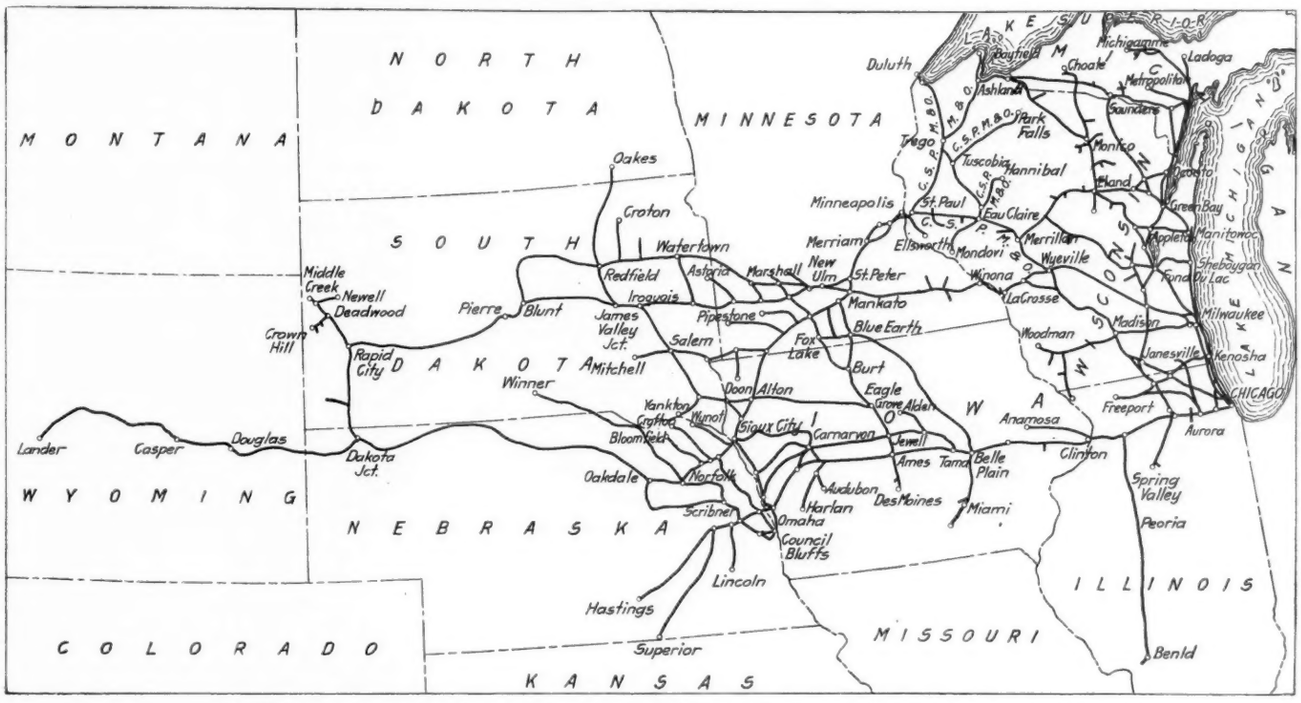
The Illinois Central and the Central of Georgia

CHICAGO & NORTH WESTERN

FOR the first time in its history the Chicago & North Western earned gross over $11,000 per mile. In the fiscal year ended June 30, 1916, total operating revenues for the 8,108 miles operated amounted to $91,314,000. After the payment of expenses, taxes and interest charges there was $17,283,000 available for dividends, and the 8 per cent on the preferred and 7 per cent on the common called for $11,116,000, leaving a surplus to be credited to profit and loss of $6,167,000.

The Chicago & North Western is a refutation of the universal truth of certain generalities which are often applied to railroads. An average of $10,000 earnings per mile for a road doing a high class competitive business is often spoken of as the minimum which a system needs to be moderately profitable to its stockholders. With the exception of 1914 the Chicago & North Western has never earned until this last year as much as $10,000 per mile. A network of branch line mileage, much of it the result of the keenest sort of competition, has often proved very unprofitable. Witness the earlier competitive railroad building in the southeast and the competitive railroad building in the southwest in more recent years. The Chicago & North Western, however, has a network of thousands of miles of branch lines. Very high class competitive passenger business is more often than not unprofitable. The Chicago & North Western does a large passenger business with fast schedules and fine trains in through service.

The Chicago & North Western is one of the most prosperous roads in the country, notwithstanding the facts just mentioned, because, despite its branch line mileage, it has a comparatively heavy average trainload—in 1916, 491 tons, as compared with 443 tons in 1915. Its main line of heavy fast passenger traffic running from Chicago to Omaha is double-tracked, as is also almost all of the important main line between Chicago and St. Paul. It has, moreover, two double-track lines between Chicago and Milwaukee. It is an originating road insofar as grain and agricultural products are concerned, while it is also an intermediary road for through traffic from the Atlantic seaboard to the Pacific coast and intermountain territory. Furthermore, it has very close relations with the New York Central Lines, the Vanderbilts being directors of the North Western as well as the New York Central. Likewise, on the west it has very close relations with the Union Pacific. Its double-track line, therefore, from Chicago to Omaha is in a very strong strategic position for both east and westbound traffic. Added to these physical characteristics and traffic relations of the road is the fact that the company is not at all heavily capitalized and the relation of bonds to stock is that of 2 to 1½, which is a smaller proportion of bonds than most of the larger railroad systems have. Much of the mileage of the North Westen was not expensive to build, and maintenance costs are not heavy. In its maintenance of equipment the Chicago & North Western has for a number of years had low unit expenditures. Repairs, exclusive of renewals, depreciation and overhead, per locomotive in 1916 cost $2,545; per freight train car, $76; per passenger car, $540. Since it is a fact that the North Western equipment is kept up to a very high standard of repair, the conclusion is inevitable that in its car and locomotive repair costs the company is fortunate either in conditions or in efficiency in the mechanical department, or both.



The Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha

In the fiscal year ended June 30, 1916, the total ton mileage of revenue freight was 7,412,300,000, an increase over 1915 of 19.24 per cent. The increase in tonnage was greater than this—26.83 per cent; but the average haul of each ton was 145 miles in 1916 as against 154 miles in 1915. The increase in mileage of freight and mixed trains was only 6.53 per cent, the total in 1916 being 18,377,000.

The total number of passengers carried one mile was 1,156,000,000, an increase of 2.27 per cent. The average revenue per passenger per mile was 1.86 cents in 1916 and 1.82 cents in 1915, and the average freight revenue per ton per mile was 8.1 mills in 1916 and 8.4 mills in 1915.

Transportation expenses in 1916 amounted to $32,119,000, an increase of $2,366,000. The largest increases were in wages of train enginemen and fuel for train locomotives, the increase in enginemen's wages being greater proportionately than in fuel costs.

During the year there was $7,972,000 general mortgage 5 per cent bonds sold to reimburse the company for capital expenditures, and $3,918,000 bonds redeemed or retired, leav-

ing a net increase in funded debt of $4,054,000. The company spent $5,753,000 for additions and betterments. At the end of the year there was $14,476,000 cash, with no loans and bills payable.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	8,108	8,108
Freight revenue	$60,353,399	$51,923,861
Passenger revenue	21,445,004	20,528,443
Total operating revenues	91,313,866	80,779,675
Maintenance of way and structures	11,608,646	10,450,739
Maintenance of equipment	14,598,777	12,648,935
Traffic expenses	1,307,139	1,288,448
Transportation expenses	32,119,223	29,753,444
General expenses	1,874,091	1,764,487
Total operating expenses	61,952,329	56,371,573
Taxes	4,741,527	4,516,943
Operating income	24,606,707	19,883,904
Gross income	27,660,182	22,683,904
Net income	17,282,510	11,914,049
Dividends	11,116,185*	11,103,669*
Surplus	6,166,325	810,380

*Including $216,570 in 1916 and $204,054 in 1915 appropriated for sinking funds

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA

THE Chicago, St. Paul, Minneapolis & Omaha operates 1,753 miles of road. It is a subsidiary of the Chicago & North Western, operating in close harmony with the parent road. Its line from St. Paul, Minn., to Elroy, Wis., is used as part of the North Western's main line from Chicago to St. Paul, and it has a line from St. Paul to Duluth and Ashland which forms an important outlet for the North Western system. Its lines from Minneapolis into Iowa, South Dakota and Nebraska have the same general characteristics as the North Western lines running into like territory. In the year ended June 30, 1916, the Omaha earned $19,523,000 operating revenues, an increase over the previous year of $1,681,000. This is at the rate, in 1916, of $11,138 per mile of road. Of the total revenue in 1916 $12,860,000 was from freight and $5,191,000 from passengers.

Total operating expenses amounted to $12,959,000, an increase of $851,000. The total ton mileage of revenue freight in 1916 was 1,578,900,000, an increase over the previous year of 18.17 per cent. The passengers carried one mile totaled 254,800,000, about 1 per cent more than in 1915. Total transportation expenses amounted to $7,208,000, or $470,000 more than in 1915. Of the increase, $380,000 was in the amount charged for wages and $236,000 in the amount charged for fuel for locomotives. There was $1,957,000 spent for maintenance of way and structures, an increase over the previous year of $384,000. The increase in maintenance of equipment expenditures was less than $60,000, and the total spent in 1916 was $2,419,000.

The Omaha in 1916 had an average ton-mile rate of 8.1 mills, comparing with 8.6 mills in 1915, and an average passenger-mile rate of 2.038 cents in 1916, comparing with 1.975 cents in 1915. The average haul of freight was 157 miles in 1916 and 152 miles in 1915, and the average passenger journey was 46.86 miles in 1916 and 52.92 miles in 1915. The average trainload of all freight was 390 tons in 1916, an increase of 8.38 per cent over the previous year.

At the end of the year the company had $2,516,000 cash, and no loans and bills payable. During the year there were $2,000,000 5 per cent debenture bonds sold, and the company spent $2,459,000 for additions and betterments.

The table below shows principal figures for 1916 and 1915:

	1916	1915
Average mileage operated	1,753	1,753
Freight revenue	$12,860,214	$11,523,103
Passenger revenue	5,191,441	4,983,700
Total operating revenues	19,522,563	17,841,348
Maintenance of way and structures	2,340,883	1,956,803
Maintenance of equipment	2,419,137	2,476,957
Traffic expenses	350,316	344,363
Transportation expenses	7,208,271	6,737,697
General expenses	472,922	433,205
Total operating expenses	12,958,838	12,107,598
Taxes	1,022,053	1,015,029
Operating income	5,535,335	4,713,887
Gross income	5,991,914	5,069,382
Net income	3,003,027	2,219,085
Dividends	2,087,117	2,086,910
Surplus	915,910	132,175

Letters to the Editor

THE ONLY TEST OF PUBLIC OPINION ON AN EIGHT-HOUR DAY

San Francisco, Cal.

To the Editor of the Railway Age Gazette:

The only test of American public opinion on the question of a general extension of the eight-hour work day to all employments that has ever been recorded was the poll taken at the general election in the state of California held on November 3, 1914.

At this election a total of 843,573 votes of both men and women was cast on the subject, and the proposed eight-hour limitation of labor was rejected almost exactly *two-to-one*. The vote was 560,881 "no" against 282,692 "yes," or an adverse majority of 278,189.

There are fifty-eight counties in California, and at this poll the eight-hour law failed to carry a single county. In some of the counties the majority against it was as high as five-to-one. In the so-called "labor stronghold" of San Francisco the adverse majority was smallest, being 70,909 "no" to 49,629 "yes," but the City of Los Angeles showed 133,704 "no" to 74,583 "yes."

The eight-hour law submitted in California to state-wide referendum was short, simple and excepted only emergency work from the restriction. Its full text, as placed on the ballot, for a "yes" or "no" vote, was as follows:

"Eight-Hour Law, Hours of Labor:

"Any employer who shall require or permit, or who shall suffer or permit any overseer, superintendent, foreman or other agent of such employer, to require or permit any person in his employ to work more than eight hours in one day, or more than forty-eight hours in one week, *except* in case of extraordinary emergency caused by fire, flood, or danger to life or property, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $50 nor more than $500, or imprisoned in the County Jail not less than ten nor more than 90 days, or both so fined and imprisoned."

This proposed law was placed upon the ballot in obedience to petitions bearing some 35,000 signatures of registered voters filed under the Initiative law. The petitions were framed and circulated by the members of the State Socialist party, which had over 50,000 registered voters at the preceding election.

Vigorous campaigns both for and against the eight-hour enactment were made, each side being sufficiently financed. The opposition was headed by farmers, fruit growers and other agriculturists, who organized for the campaign. The eight-hour proposal was third on the ballot among forty-eight propositions submitted, and both in publicity, general interest and total vote polled, was a close second only to the state-wide prohibition measure.

The defeat of prohibition, by "no" 524,781 to "yes" 355,536, was not nearly so overwhelming as the rejection of the eight-hour rule.

The total vote cast for all five candidates for governor at this same election was 926,667, divided as follows: Hiram W. Johnson (Progressive), 460,495; John D. Fredericks (Republican), 271,990; Curtin (Democrat), 116,121; Richardson (Socialist), 50,716; Moore (Prohibitionist) 27,345.

The Progressive party governor (Johnson) was re-elected by 188,505 votes over the Republican, Fredericks, which was the largest plurality ever given a gubernatorial candidate in California's history. Therefore, the eight-hour law could not be called a Progressive measure.

Women worked actively throughout the campaign and cast about 40 per cent of the total vote. The women voters, for sentimental reasons, were a large majority supporters of the eight-hour law, so the male vote must have been four or five to one against the measure.

Observer.

Why the Intercolonial Railway Is a Failure

Uneconomical Government Management as Well as Low Rates Caused Enormous Losses—Recent Improvement

By Samuel O. Dunn
Editor of the *Railway Age Gazette.*

IN the issue of the *Railway Age Gazette* for October 6 there was published an article by J. L. Payne replying to my articles on "The Failures of Government Ownerships in Canada," which were published in the issues of this paper for July 14 and July 21.

I must express my appreciation of the friendly tone of Mr. Payne's criticisms of my article and of the fair and judicial manner in which he has presented his case. I have long entertained a high regard for him and his work, and the good temper and skill with which he has discussed the management and results of the Intercolonial enhance my regard for his fairness and ability. I do not think anybody could make out a better case for the road than he has.

At the same time, after a careful study of the data and arguments he has presented, I am unable to revise the conclusions regarding Government management of the Intercolonial presented in my original article. His main contention is that the facts regarding its management do not constitute an argument either for or against State ownership.

The advocates of Government management claim that it will confer certain advantages on the public. I maintained in my article, and I still maintain, that Government management of the Intercolonial has failed to confer these advantages, and that its results yield evidence which is relevant in a discussion of the general subject of State ownership.

Mr. Payne puts stress on the fact that the Intercolonial was brought into existence to bind together the English and French provinces of Canada, and that a roundabout route was selected to avoid having it pass through a part of the United States or near our border. These circumstances were stated in my article. But, as I also pointed out, the Government has owned the road for a half century. The political conditions which existed at the time of the creation of the Confederation, and the relations prevailing between Canada and the United States, long ago underwent radical changes. Is it not therefore fair to suggest that the Government should long ago have changed the route and modified the management to meet the changed conditions? It would have been feasible years ago to have shortened the line, as the enterprising managements of private railways in the United States, in Canada and in other countries have done.

Mr. Payne raises a question as to why I rested my case largely on a comparison of the operating results of the Intercolonial with those of the Eastern lines of the Canadian Pacific. He asserts that the calculations from which my statistics for the Canadian Pacific eastern lines resulted are not reliable. These statistics were derived from official sources on the Canadian Pacific; the calculations by which they were arrived at were made in the same way as similar calculations are made all over the United States and Canada in segregating the operating and financial statistics of different railways and of different parts of the same railway, and I have no doubt of their reliability.

He says that "the Canadian Pacific has relatively small interests in the maritime provinces," that "it does not operate a single mile of line in Nova Scotia," and that "less than five per cent of Canadian Pacific mileage is in the territory which the Intercolonial was built to serve." A careful check of the authorities shows that the Intercolonial and the Canadian Pacific eastern lines have the following mileages in the territory to which he refers:

	Canadian Pacific	Intercolonial
Nova Scotia	294 miles	473 miles
New Brunswick	443 "	537 "
Quebec (east of Montreal)	348 "	453 "
Total	1,185 miles	1,463 miles

In addition, the Canadian Pacific operates, as a part of its eastern lines, 234 miles in the state of Maine under conditions somewhat similar to those prevailing in the maritime provinces of Canada.*

Mr. Payne says, however, that it would have been entirely fair for me to have measured the Canadian Pacific as a whole against the Intercolonial as a whole, and adds that he will "make it quite plain that if the Intercolonial had enjoyed the passenger and freight rates of the Canadian Pacific it would have had relatively higher net earnings than the latter," "while if the Canadian Pacific had been compelled from the outset to subsist on the earning power of the Intercolonial it would long ago have passed into the hands of a receiver."

The Canadian Pacific lines west of Montreal, and especially those west of Port Arthur and Port William, operate through a territory in which rates are much higher than they are east of Montreal, just as rates in the United States are higher west than they are east of Chicago. But I am quite willing to meet Mr. Payne on his own ground. He says that the application to the Intercolonial's traffic of the average freight and passenger rates of the Canadian Pacific system shows that the losses of the Intercolonial have been due entirely to the lowness of its rates. But when he applies the average rates of the Canadian Pacific to the Intercolonial he shows that with these rates the Intercolonial could not earn four per cent on its cost of construction, which is a much smaller return than the Canadian Pacific does earn with them, while when he applies the average rates of the Intercolonial to the Canadian Pacific he shows that the Canadian Pacific would have earned 2.6 per cent with them, while with these same rates the Intercolonial did not earn any return at all.

Intercolonial Results with "C. P. R." Rates

Mr. Payne's argument from the results in 1913 has, however, a more serious weakness than this. He says that he used the figures for that year for certain reasons which he sets forth, and that "it will not be said, therefore, that I have gone out of my way to select a weak parallel or to choose a year that was favorable to the Intercolonial." I do not question his fairness, but a series of calculations does disclose that, as a matter of fact, the figures for the very year he did choose were the best afforded by any year in history to make out a case for the Intercolonial. I have taken the Canadian Pacific's average freight and passenger rates for each of the last eight fiscal years for which complete figures are available, and applied them to the Intercolonial's business, and the following table shows its percentage of net return on its cost of construction would have been higher on

*Authorities: Railway Statistics of Canada, Poor's Manual, and Official Guide of Railways, and the maps accompanying the annual report of the Department of Railways.

the "C. P. R.'s" basis of rates in 1913 than in any other year.

Actual and Estimated Results of Intercolonial

	Actual Net Earnings or Deficit	Estimated Net Earnings on C. P. R. Rates	Rate of Return on Cost of Road on C. P. R. Rates Per Cent
1915	—$89,046	$2,217,639	1.95
1914	—291,271	2,824,250	2.46
1913	—161,016	3,806,355	3.75
1912	250,517	3,070,072	3.50
1911	281,877	3,122,850	3.66
1910	700,278	2,695,415	3.68
1909	—449,535	1,973,840	1.73
1908	—413,139	1,729,485	1.50

Average rate of return on average cost of road for eight years, if average rates had been same as Canadian Pacific, 2.78 per cent.

It will be seen that the net return earned in 1913 on the Canadian Pacific's rates would have been 3.75 per cent; that the net return in the eight years would have varied from this amount down to as low as 1½ per cent; and that the average return for the entire period would have been 2.78 per cent. These figures show that even if the Intercolonial had had the average rates of the Canadian Pacific system it would have failed in every year, and in most years by a wide margin, to have earned four per cent on its cost, although the Canadian Pacific on these same rates has become, according to Mr. Payne, "beyond all doubt the most prosperous railway in the world." Mr. Payne's figures for the Intercolonial are for its fiscal year, which ends on March 31, while mine are from the Railway Statistics of Canada, which are for the years ending June 30. But, as Mr. Payne points out, this slight discrepancy in dates is of no consequence.

How much could the Intercolonial have earned on the average freight and passenger rates received by the Canadian Pacific's eastern lines? I have the average freight and passenger rates for the eastern lines only for the years 1914 and 1915. In the former the Intercolonial on these rates would have earned only 1½ per cent, and in the latter only 1.1 per cent.

Intercolonial Compared with Pere Marquette

The foregoing statistics sustain rather than refute my contention that the enormous losses of the Intercolonial have been due more to the way in which it has been managed than to the lowness of its rates. But, perhaps, as Mr. Payne implies, it is not entirely fair to compare the Intercolonial with only one road and that one of the most prosperous in the world. I shall, therefore, make a comparison between it and one of the least prosperous railways in the United States, viz., the Pere Marquette. This road has been in the hands of receivers since April 15, 1912, and yet its statistics for the fiscal year it became bankrupt indicate better management in every respect than do the figures of the Intercolonial for the same year. The following are certain statistics for the Intercolonial and the Pere Marquette for the year ended on June 30, 1912:

	1912	
	Intercolonial	Pere Marquette
Mileage	1,463	2,331
Capitalization (or cost of construction) per mile	$64,761	$40,458
Freight density (ton miles per mile of road)	866,490	750,427
Average rate per ton per mile, cents	.565	.643
Pass. density (pass. miles per mile of road)	119,298	96,417
Average passenger rate per mile, cents	1.686	1.80
Total operating revenue per mile	$7,521	$7,154
Operating expenses per mile	$7,349	$5,752
Net operating revenue per mile	$172	$1,402
Total net operating revenue	$250,517	$3,192,447
Taxes, total	None	$667,704
Taxes per mile	None	$286
Total net operating income	$250,517	$2,524,743
Average freight train load, tons	262	335
Average haul per ton, miles	270	168

The Intercolonial's freight density was 15½ per cent greater than that of the Pere Marquette and its passenger density 23.7 greater, while its cost of construction per mile was 60 per cent greater than the Pere Marquette's capitalization, and its operating expenses per mile 27.7 per cent greater. The Pere Marquette's average freight and passenger rates were somewhat higher than those of the Intercolonial and because of this and its more economical construction and operation, it was able, in spite of its lighter traffic, to earn $1,402 net operating revenue per mile, while the Intercolonial's net operating revenue per mile was only $172. The Pere Marquette paid $667,704 in taxes. The Intercolonial paid none; its total net operating revenue was only $250,517; while if it had paid taxes at the same rate as the Pere Marquette, its taxes would have amounted to $418,418. After having paid $668,000 in taxes, the Pere Marquette had left $2,524,743 of net revenue applicable to interest and dividends.

Mr. Payne says, "With a large percentage of corporate-owned roads in the United States in the hands of receivers, it is a little dangerous for an opponent of state control to make net earnings a test of the underlying principle." Manifestly, there is a wide difference between the results of a road like the Intercolonial, which ordinarily does not even earn its operating expenses, and the results of a road like the Pere Marquette, which, after earning its operating expenses, large amounts for taxes and a substantial net return, while charging relatively low rates, becomes bankrupt merely because its net return is not sufficient to pay interest on a relatively small bonded indebtedness. In the year 1912, of course, the Intercolonial did earn its operating expenses, but in that year it happened to be especially prosperous.

One of the main reasons why the Pere Marquette is more economically operated than the Intercolonial is indicated by the statistics regarding the average freight trainload. The Pere Marquette gets an average haul per ton of only 168 miles, as compared with 270 miles for the Intercolonial, and its freight traffic density is less, and yet in 1912 it hauled 335 tons per train as compared with only 262 tons for the Intercolonial.

The Service of the Intercolonial

Mr. Payne contends that the Intercolonial is a well-maintained property and gives "an unsurpassed service," and he assumes that my comments on its physical condition and service were based on information which came to me second-hand. On the contrary, I went to Canada a year ago for the express purpose of observing on the ground the condition and service of the Intercolonial. I rode over the entire main line from St. John to Moncton and from Moncton to Montreal, thereby traversing about two-thirds of its total mileage. I have been seeing from 20,000 to 30,000 miles of railway annually for about 10 years, and I must say that I found little evidence on the Intercolonial of the superior physical conditions and unsurpassed service to which Mr. Payne refers. The roadbed is good in places, but for the most part is of about the same standard as that of the average single track railway in the western part of the United States or Canada.

As to the service, the published schedules show that the only passenger train which makes an average speed of as much as 40 miles an hour is the Ocean Limited which operates between Montreal and Halifax only in the summer time. It makes the run of 836 miles from Montreal to Halifax in 20 hours and 40 minutes. This is 40 miles an hour. From Halifax to Montreal it consumes 25 hours and 5 minutes, averaging only 33.4 miles an hour. The second best train between Halifax and Montreal is the Maritime Limited, and its speed is substantially less than that of the Ocean Limited. I rode part of the way from Moncton to Montreal on the Maritime Limited; and I felt some astonishment when I found that although it was the second best train on the road it was composed of wooden sleeping cars built at the Buffalo works of the Wagner Palace Car Company before this company went out of existence. As the Wagner company was absorbed by the Pullman company 16 years ago, the age of these cars cannot have been less than 15 years. Any railway in the United States which should carry in one of its best

trains wooden sleeping cars 15 or more years old would hardly dare boast of its superior service.

Reduction of Expenses Under Present Management

I have reserved to the last the most conclusive evidence of the justice of my criticism of the uneconomical way in which the Intercolonial has been managed practically throughout the time it has been owned by the government of Canada. Somewhat over two years ago the road was given a new general manager in Frank P. Gutelius. Mr. Gutelius, who had been general superintendent of the Canadian Pacific, was an experienced, able and energetic railway officer, and the government apparently gave him full authority to operate the road as a railway rather than as a political machine. In my previous article I referred to the efforts he was making to improve the operation of the property and the difficulties he was encountering. It appears, however, that the present government has steadily supported him and that he has been highly successful. The statistics of earnings and expenses of the Intercolonial in the year ended March 31, 1916, are now available and they show that in that year the operating ratio of the road was the lowest, being 85.6 per cent, and its net earnings the largest in its history. In my original article I contended that its maintenance of way expenditures were too small, while practically all of its other expenses were too large. I did not know it then, but the figures now available show that Mr. Gutelius was engaged at the time I wrote my article in increasing the only expenses that I said were too low, and in reducing all of those that I said were too high. The following table presents statistics regarding the operating expenses and earnings of the Intercolonial in the two years ended on June 30, 1914, and 1915, and in the year ended on March 31, 1916:

Intercolonial Railway

Operating Expenses

	(March 31) 1916	(June 30) 1915	(June 30) 1914
Maintenance of way	$2,279,778.20	$2,116,981.64	$2,118,438.46
Maintenance of equipment	2,067,679.33	2,235,592.47	2,791,241.53
Traffic	256,871.81	260,369.34	281,562.58
Transportation	6,980,716.14	6,416,586.68	7,191,476.68
Miscellaneous operation	152,058.44	.....	.....
General	304,391.92	319,225.78	318,959.93
Total	$12,041,495.84	$11,348,755.91	$12,701,679.18

Earnings

Freight	$9,200,339.21	$7,187,449.01	$8,168,438.32
Passenger	3,994,641.63	3,239,921.44	3,542,332.01
Mail and express	781,452.30	707,969.81	595,323.67
Miscellaneous (net)	92,358.27	124,369.66	104,314.47
Total	$14,068,791.41	$11,259,709.92	$12,410,408.47
Ratio of operating expenses to earnings, per cent	85.6	100.7	102.34

Comparison of results, 1916 with 1914

Reduction in transportation expenses	$210,760.54
Reduction in total operating expenses	660,183.34
Increase in earnings	1,658,382.94
Increase in net earnings	2,318,566.28

As the figures indicate, the road had a large increase in traffic in the year ended March 31, 1916, its total earnings being $1,658,382 larger than in 1914. Furthermore, the expenditures for maintenance of way in 1916 were $161,000 greater than in 1914. But in spite of the large increase in its total traffic, and of the increase in expenditures for maintenance of way, Mr. Gutelius succeeded in reducing total operating expenses by $660,183. The increase in gross earnings and the reduction in operating expenses converted a deficit of almost $300,000 in the year ended on June 30, 1914, into net earnings of $2,027,296 in the year ended on June 30, 1916. What more complete vindication could be given to my contention that the losses of the Intercolonial have been due chiefly to extravagant management?

It may be said that these figures show that railways can be economically managed under government ownership. I have never denied this. I have always contended that the important question is not what *can* be done but what probably *will* be done. The fact that for 50 years the Intercolonial failed, on the whole, to earn its operating expenses, and that then within two years an operating deficit of $300,000 was changed to net earnings exceeding $2,000,000, shows, if it shows anything, that it is about a "fifty-to-one" shot that a government railway will not be efficiently operated. It may be argued that if there had been a proportionately large increase in earnings before, similarly favorable results might have been secured by the preceding management. But, as a matter of fact, between 1912 and 1914 the total earnings increased by $2,285,000—much more than they increased between 1914 and 1916; and yet there was a still greater proportionate increase in operating expenses, with the result that a small amount of net earnings in 1912 was converted into an operating deficit in 1914.

The relatively good showing of the Intercolonial in 1916 is as much an indictment of the previous management of the road for 50 years as it is a tribute to the courage, energy and ability of the present minister of railways, Mr. Cochrane, and the present ganeral manager, Mr. Gutelius. Just how long Mr. Cochrane and Mr. Gutelius will be allowed to continue their good work is an open question. Their popularity in the maritime provinces has not been enhanced by their course in running the railway as a railway instead of as a political machine. When the figures for 1916 were reported in parliament they were sharply criticized by members who find it more advantageous to themselves to have the road run as a political machine. Furthermore it will be noted that even the relatively large net earnings of 1916 fall far short of being adequate to pay four per cent interest on the cost of construction, as officially reported, which now amounts to about $105,000,000.

The evidence seems to establish conclusively the contention made in my original article, that the losses of the Intercolonial have been due mainly to its uneconomical operation and expensive construction.

Should Intercolonial Earn Its Interest?

Suppose, however, that its operation was raised to the highest practicable standard of efficiency, and that because of the lowness of its rates it should continue to fail to earn interest on the investment; should its rates then be raised? Mr. Payne's answer is in the negative, and he bases it on two grounds. These are: (1) "Rightly or wrongly, the people of the maritime provinces believe it was an absolute and fundamental part of the original agreement that the rates of the government line should never produce more than operating expenses"; (2) that the canals of Ontario and Quebec, from which the people of New Brunswick and Nova Scotia do not derive any benefit, require an annual expenditure of $1,700,000 for operation and upkeep and earn no interest. "The Canadian Confederation," says Mr. Payne, "is not so perfect that the maritime provinces would consent to pay the fixed charges of the Intercolonial while the upper provinces went scot free on account of the canals."

I am not concerned with the political situation in Canada, and the only comment I have to make on this phase of the matter is that it is almost universally true in democratic countries, as it is in Canada, that under government ownership political questions get so mixed up with questions of railway management as to render it practically impossible, as is the case in Canada, to consider questions of management on sound, economic grounds. "Politics corrupts the railroads and the railroads corrupt politics."

Mr. Payne's statement that the people of the maritime provinces would not consent to the Intercolonial earning interest on the investment in it so long as the canals in Ontario and Quebec did not earn their upkeep and interest, opens out a vista of rather ominous possibilities in a country which already has entered on a large scale upon public ownership and management, and is considering taking over all the rest of its railways. If the Intercolonial ought not to

be so managed as to earn its interest because the canals are not, then, of course, the National Transcontinental, which the Canadian government now owns, also ought not to be so managed as to earn its interest. If the Intercolonial and the National Transcontinental ought not to be so managed as to earn their interest, then, of course, if the government should take over the Grand Trunk Pacific and the Canadian Northern it ought to run them also at a loss. It would not be right to subject the Canadian Pacific to that kind of competition, and the government probably would have to take it over, too.

The logical result of acting consistently on this principle would be that the government would saddle itself with the ownership and management of canals and railways representing at present a total investment of almost two and a half billion dollars, and that the taxpayers would have to pay out of their pockets interest charges on this investment amounting to about $100,000,000 a year. Canada is a large and growing country. The time will come when it will have railways representing an investment equal to that of the railways of the United States, which is now almost $20,000,000,000, to say nothing of the investment it may make in canals. Following the precedent which has been established in the case of the canals and of the Intercolonial, the government would have to operate all of these railways and canals so as not to earn any interest, which means that the taxpayers would have to pay eight or nine hundred million dollars a year in interest on the investment in them.

If it would be proper and possible for the government of Canada to adopt sound principles 50 years from now in dealing with its railways, and especially in managing the railways which it may then own, it would be equally proper and possible for it to adopt sound principles in dealing with and managing its railways now. The unsound principles according to which the Intercolonial is now managed are said, by the defenders of its management, to be due to the "peculiar conditions" in Canada. But, as a matter of fact, those who have studied the subject of government ownership extensively know that this same argument is advanced in every country where it can be demonstrated that government ownership and management is a failure. The losses of government railways always are attributed by the defenders of that policy to "special conditions"; and always when the facts are investigated it is found that most of the losses are due to wasteful management, and that most of the wasteful management is due to politics.

1915 RAIL FAILURE STATISTICS

The American Railway Engineering Association has just published the statistics of rail failures for the year ending October 31, 1915. This information was compiled by M. H. Wickhorst, engineer of tests for the rail committee of the association, from data furnished by the various railroads and includes 7,397,699 tons of rail of which 1,384,858 tons is Bessemer rail and 6,012,841 tons is open-hearth rail. This tonnage covers rollings for 1910 and succeeding years up to and including rails rolled in 1915. Statistics have been kept also for rails, rolled in 1908 and 1909, but as the records are discontinued after the rail is in track for five full years, the records for 1908 and 1909 are now closed.

The Bessemer rails are continually becoming a small proportion of the total amount of rail reported. Of 634,898 tons reported for 1915 only 13,295 tons is of Bessemer steel. The table below shows the relation between the failures of Bessemer and open-hearth rails for the several years' rollings. In the last two columns comparative failures are indicated by figuring the failures per 100 miles of track for open-hearth rails as 100 for each of the years respectively. It will be noted that the failures in Bessemer rails are about 50 per cent higher per 100 miles of track than those of the open-hearth rails. This probably does not show the real comparison, as the open-hearth rails are undoubtedly used in more severe service:

FAILURES OF OPEN-HEARTH AND BESSEMER COMPARED

Year Rolled	Years Service	Failures per 100 track miles		Comparative failures	
		Open-hearth	Bessemer	Open-hearth	Bessemer
1910	5	153.1	236.9	100	154
1911	4	115.5	178.8	100	155
1912	3	46.0	66.9	100	143
1913	2	24.8	35.2	100	142

A comparison between open-hearth and Bessemer rails is obtained from the statistics for rails rolled from 1908 to 1913 inclusive, thus including only rails having two years or more service. This is given in the table below:

BESSEMER FAILURES COMPARED WITH OPEN-HEARTH FAILURES TAKEN AS 100

Year Rolled	Years Service			
	2	3	4	5
1908	...	...	...	112
1909	...	...	195	188
1910	...	230	207	154
1911	249	291	155	...
1912	219	143	...	...
1913	142	...	...	...

A comparison of the failures of rails from the different mills from 1910 to 1913 inclusive using 100 to represent the average, of the failures of all mills for each year's rolling, is given in the accompanying table. This gives the record for five mills rolling Bessemer rails and nine mills rolling open-hearth rails.

One of the most important purposes of these statistics is to obtain comparisons of the performance of rails rolled from year to year and since the records are complete for the three years 1908, 1909 and 1910, it is possible to make comparisons of the total number of failures in rails rolled in these three years for the full five year periods. It is noted that both the Bessemer and open-hearth rails show reductions in the number of failures in the successive years. The average failures per 100 miles of rollings for several years including both Bessemer and open-earth rails is given below:

Comparison of Failures for the Different Mills, using 100 as the Average of Failures of all Mills for Each Years Rollings.

Mill	1910		1911		1912		1913	
	Relative Failures	Rank	Relative Failures	Rank	Relative Failures	Rank	Relative Failures	Rank
BESSEMER								
Illinois	86.9	2	99.4	3	81.9	1	79.0	3
Maryland	77.3	1	35.9	1	97.0	2	165.3	5
Lackawanna	92.6	3	155.0	5	151.7	3	74.4	2
Cambria	171.2	4	138.2	4	186.8	4	57.1	1
Carnegie	205.5	5	88.8	2	212.1	5	84.7	4
OPEN HEARTH								
Tennessee	35.8	1	36.7	1	95.4	5	66.5	2
Colorado	39.8	2	47.3	2	120.9	7	44.4	1
Pennsylvania	80.9	4	107.0	6	59.8	2	84.7	4
Carnegie	66.0	3	110.7	7	120.2	6	78.2	3
Illinois	134.7	8	96.8	4	85.3	3	88.3	5
Lackawanna	97.2	5	97.7	5	86.1	4	126.7	7
Maryland	106.3	6	52.6	3	39.3	1	298.8	9
Bethlehem	216.1	9	226.4	9	113.3	8	108.5	6
Cambria	131.3	7	204.8	8	161.5	9	199.6	8

Year Rolled	Years Service					
	0	1	2	3	4	5
1908	.....	.....	.....	.....	.....	398.1
1909	.....	.....	.....	.....	224.1	277.8
1910	.....	.....	.....	124.0	152.7	198.5
1911	.....	.....	77.0	104.4	133.3	.....
1912	.....	28.9	32.1	49.3	.....	.....
1913	2.0	12.5	25.8	.....	.....	.....
1914	1.2	8.2	.....	.....	.....	.....
1915	0.7	.....	.....	.....	.....	.....

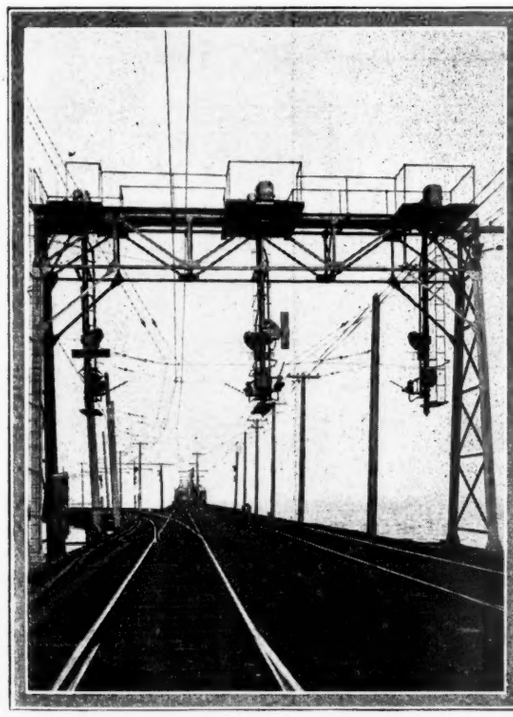
A study of this table shows that there is a decrease in the number of failures from year to year not only in the case of the five year period but also in the case of a less number of years service. This condition is due partly to the gradual replacing of the Bessemer by the open-hearth rail and partly to an improvement in both the Bessemer and the open-hearth records.

Terminal Signaling with 45-Seconds Headway

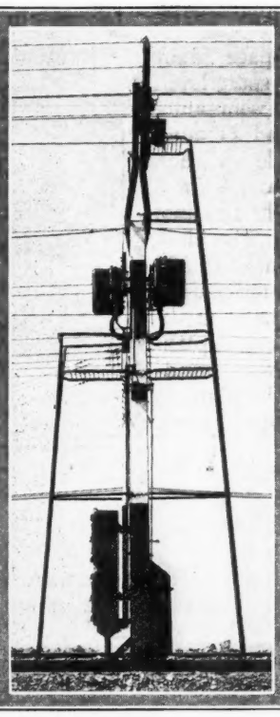
Dense Traffic and Adverse Weather Conditions Made Exceptional Provisions Necessary on New Oakland Pier

AN unusually complete system of terminal signaling and interlocking has been installed by the San Francisco-Oakland Terminal Railway on its pier line recently reconstructed from Oakland, Cal., to the company's ferry terminal located 3.4 miles out in San Francisco bay. While this terminal is used exclusively by electric trains which connect with the trans-bay ferry service, the operating problems presented are not radically dissimilar from those found in similar steam road terminals, and the methods adopted for safeguarding the traffic are, in most respects, applicable to such terminals whether they are electrified or not.

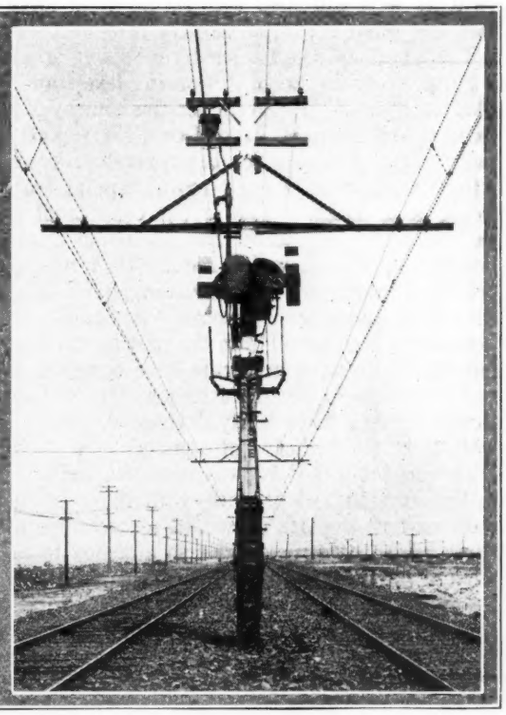
The dense traffic and the extremely heavy fogs encountered require a reliable and efficient signal system which will permit of the closest possible headway, allowing a safe braking distance at the speeds prevailing over the line. The signaling, as adopted, includes 31 new automatic block signals, the relocation and reconstruction of 42 automatic block signals formerly in use on the old line, the addition of signal power equipment and the complete reconstruction of a mechanical interlocking plant located at the pier terminal. The work was done under contract by the Union Signal Construction Company, a subsidiary of the Union Switch & Signal Company.



Double-Track Bridge Showing Suspended Signals



Side View of Double Location



Typical Double Signal Location Showing Mechanism Mountings

Block Signaling

The automatic block signaling provides for the movement of trains under a 45-sec. headway westbound and for leaving the terminal eastbound under a 30-sec. headway, which is gradually increased to 45 sec. when the average running speed of 36 miles an hour is reached. Signals are of the top mast, upper right-hand quadrant, three-position type, mounted on center trolley poles and equipped with automatic stops.

The new signals installed are of the U. S. & S. style "T-2" type, equipped with 110-volt, 25-cycle, single-phase induction motors. They require from 8 to 10 sec. to operate from the 0-deg. to the 90-deg. position. In arranging the signal spacing to provide the required headway, 350 ft. was allowed for the average train length, 4½ sec. for sighting time, and 10 sec. for clearing time. Trains running at speeds of 36 m.p.h. under a 45-sec. headway are spaced approximately 2,026 ft. apart, which requires a signal spacing of 420 ft. The full block overlap, with the automatic stop used, provides a braking distance of 420 ft.

Automatic Stops

The automatic stop is considered necessary for the safe operation of trains under the headway and at the speeds demanded by the service, which must be maintained regardless of weather conditions. In the heavy fogs encountered during certain seasons of the year, it is difficult to see a signal indication more than 200 ft. The automatic stop arm is connected to the spectacle casting and when the signal is in the stop position the stop arm is in position to engage the arm of a valve located on the roof of each car. Trains are made up of cars capable of operating at average maximum speeds of 36 m.p.h., the actual braking distance of a loaded 7-car train operating at this speed ranging from 300 to 350 ft. when the automatic stop is applied.

The action of the stop valve may be summed up as follows: When a train running in the normal direction of traffic undertakes to pass a stop signal, the valve is tripped

by the stop arm on the signal, applies the brakes and is automatically restored to its normal position after the required stop has been made; whereas if a train is running against the normal direction of traffic, which is sometimes necessary, the valve is tripped in the against-traffic direction, remains down without applying the brakes and is restored to its normal position by a reduction in train line pressure, which is made when the train stops to reverse direction.

In case a signal is out of order or it is desired to use a cross-over, it becomes necessary to pass an automatic signal in the stop position, provision being made for this by means of a keying device. By inserting a key in the lock located at the base of the signal post, the trainman unlocks the stop arm and is enabled to raise it. The key cannot be taken out of the lock until the stop arm is returned to the stop position, thereby insuring its return after a train has passed under the signal. Each trainman has one key, which he is required to keep on his person at all times.

Pier Terminal Interlocking

The pier terminal interlocking formerly consisted of a mechanical machine of the Saxby & Farmer type, having 28 working levers and one spare space to control 13 wire-connected signals, 12 switches and 7 facing-point locks. Switches were equipped with facing-point locks and detector bars, the plant being mechanical throughout.

The plant as reconstructed consists of a 45-space Saxby & Farmer machine with 44 working levers and 1 spare lever. The machine has 21 levers for the control of 21 semi-automatic electric signals, 21 call-on light signals and 21 automatic stops; 6 levers for the control of 6 single switches, 6 for 6 cross-overs, 1 for 1 movable-point frog, and 8 for 8 facing-point locks. The layout consists of eight terminal tracks converging into the two main-line tracks. The plant handles approximately 520 regular train movements and 270 switching movements per day, the service being maintained through a period of 20 hours. Although the train movements have been handled in the past by the mechanical plant and but few serious accidents have occurred, it was considered advisable in reconstructing and enlarging the plant to provide, among other safety devices, automatic stops to check against the disobedience of signals.

The mechanical work was reconstructed and installed according to standard practice, with the exception of the rail brace and riser plate shown in an accompanying drawing. These are so constructed and so attached to the gage plates that the track is held absolutely to gage at switches, regardless of the condition of other rail braces in the vicinity, and regardless of the strain placed upon the track. They are easily installed and require no adjustment after installation. They were designed by Mr. Casselman, signal foreman, and manufactured by the U. S. & S. Company.

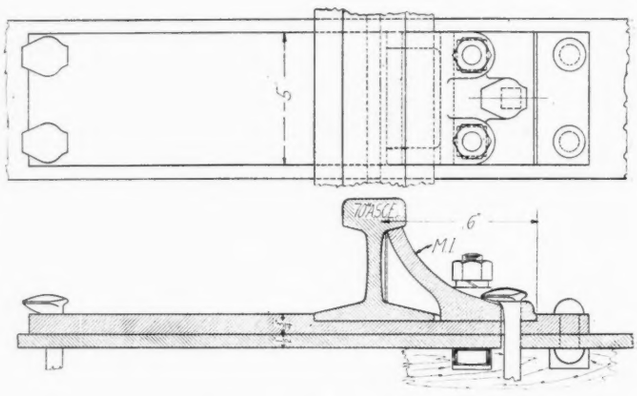
Electrical Features

The use of a yellow light as a "calling-on signal," the application of an overhead automatic stop to interlocked signals and the control of a semaphore signal, a calling-on signal and an automatic stop all from a single lever are probably the most notable features in connection with the installation.

The semaphore arms are placed 17 ft. 3 in. above the top of rail to give the best possible view at short range and, at the same time, provide proper clearances. The point of impact on the stop arms in the normal position is 12 ft. 11⅜ in. above top of rail, and the stop arm must operate to a position at least 45 deg. above normal. Therefore the space available for the location of a calling-on signal was limited, making the use of a light signal for this purpose desirable. From a first cost and maintenance standpoint such a signal offers a number of advantages and the stop arm provides a reliable means of checking its operation. The indication displayed by the yellow light is clearly visible through the required distances in the brightest sunlight.

The application of an overhead automatic stop to interlocked signals at this location presented difficulties which may be outlined as follows: (First) As each car of a train is equipped with automatic stop valves, the stop arm on the signal must be retained in the clear position until the last car of a train has passed under it. (Second) On account of the close train spacing necessary in movements through the plant, the semi-automatic signal cannot be retained in the clear position until the last car of a train has passed it, as was done in automatic signal territory where the full block overlap was used, but must assume the stop position as soon as the first track section over the route is occupied. (Third) The tripping of stop valves in the direction in which they are not effective is undesirable within the interlocking plant, and it is therefore necessary to clear the stop arms on opposing signals as the train passes under them. This must be done without sacrificing the protection for which the stop arm is intended. (Fourth) The stop arm must be cleared when the "calling-on signal" is given, with the semaphore signal in the stop position. (Fifth) The control of the stop arm must be so checked that the towerman cannot unconsciously trip a train which is passing under the stop arm.

In clear weather all of the tracks are in plain view of the



Rail Brace and Riser Plate

towerman, but to indicate the occupancy of tracks in foggy weather an illuminated diagram was installed. The lights in this diagram are controlled directly through corresponding track circuit relays, energy being taken from the 12-volt tap of an air-cooled transformer located in the relay cabinet.

A telautograph set was installed, connecting the train director's stand, located in the terminal shed, with the tower. The set consists of one sending instrument located at the train director's stand and one receiving instrument suspended just beneath the illuminated diagram in the tower. The telautograph furnishes a permanent record, both in the tower and at the train director's stand, of all instructions given, and its use has resulted in the elimination of errors resulting from the towerman's tabulation of information received over the telephone, as was formerly the custom. Its use has also resulted in a great saving of the towerman's time, since he can note instructions written before him on the receiving instrument and manipulate levers at the same time. The set was furnished by the Gray National Telautograph Company, New York.

The semaphore signals are of the style "T-2," three-position type, located to the left of tracks over which they govern, this being necessary to utilize the automatic stop valves

located on the cars. The automatic stop arms are operated by a separate style "T" mechanism, clamped to the signal post just below the semaphore signal.

Operation of Apparatus

As was previously stated, a semaphore signal, a call-on light signal and an automatic stop are all controlled from a single lever. The method of operation is as follows: Under normal operation, with the route set up and all track sections over which a signal governs unoccupied, a semaphore signal is cleared by simply placing the signal lever in the reverse position. The stop arm and signal controlled from this lever assume the clear position immediately upon the reversal of the lever and the stop arm of the opposing signal or signals in the route will remain at stop until the train occupies a short track section immediately ahead of the opposing signal.

Immediately upon the occupancy of the track circuit referred to, the stop arm moves to the clear position, energy being supplied through reversed contacts on the signal lever which permitted the train to occupy the section and a back contact on the track relay of the section. The towerman is prevented from moving the lever referred to from the reverse position until the train occupies the short section, which clears the opposing stop arm. This stop arm is retained in the clear position, after being cleared as already described, until the rear end of the train passes under it, regardless of whether or not the signal lever has been placed normal in the meantime.

If any one of the track sections over which a signal governs is occupied, the towerman notes it by observing the lights in the illuminated diagram or by observing the position of the train in the plant, and may give a call-on signal by standing on a floor push and reversing the signal lever. The call-on signal cannot be given and retained unless a train occupies the approach to the signal, and after being given remains displayed until the train passes off the approach, when it is automatically taken away regardless of the position of the lever. If it is to be displayed for a second train moving over the same route, the lever must be placed on center and again reversed with the operator standing on the floor push.

The stop arm on the signal being controlled from the lever referred to is cleared from either the semaphore signal circuit or the call-on signal circuit and the semaphore signal or call-on signal cannot be displayed until the stop arm has reached its clear position. Stop arm circuits are selected through trailing, as well as facing point switches.

Points Common to Automatic Signals and Interlocking

Keystone insulated joints were used in the interlocking and in that part of the automatic territory located on trestle. This joint is specially adapted to track supported on trestle and required no dapping of the ties.

The signal rail is bonded throughout with two copper-clad No. 8 bond wires to each joint. The copper-clad bond wire withstands the severe vibration at this location better than solid copper and offers more resistance to corrosion than galvanized iron.

With the exception of the weatherproof wire in the transmission line, which was manufactured by the Standard Underground Wire & Cable Company, Kerite wire and cable was used throughout.

All trunking was redwood, which was dipped in a good grade of black paint before installation and painted one coat of black paint after installation. On the solid fill, trunking is supported on oak stakes spaced 4 ft. apart, and on the trestle structure the trunking is supported on the ties and stringers.

RESULTS OF THE M. C. B. LETTER BALLOT

Under Circular No. 6 the Master Car Builders Association presented 95 propositions, occupying a total of 94 pages, to its members for a letter ballot vote. Of those 95 propositions six were rejected, the most important of which was the design of the No. 2 Brake Beam which has been so persistently presented by the Brake Beam Committee for the past five years. This design was shown and described in the report of the committee which was abstracted in the *Daily Railway Age Gazette* of June 15, 1916, on page 1293. This year the vote was even greater for its rejection than on any of the other years at which this beam was presented to the association, the following being a record of the votes cast each year:

Year	Yes	No	Total	Necessary to adoption
1912	834	843	1,677	1,118
1913	806	1,060	1,866	1,244
1914	737	1,393	2,130	1,420
1915	No vote was taken			
1916	710	1,609	2,319	1,546

The other propositions rejected were the placing of the horizontal bars above and below the initials and number of the car in the "Marking of Freight Equipment Car Standard"; the change in the steam hose coupler contour to give a guard arm of sufficient height and length to make all steam hose locks effective; the change in brake beam specifications in which the nominal diameter of the tension member of the beam should be 1¼ in.; the specifications for reinforcing existing car doors, and the change in the revised train lighting rules to the effect that "fuse boxes shall have mounted in them a block provided with fuse contact having a capacity of 101 to 200 amperes."

Of those propositions accepted it is interesting to note that the marking for freight cars has at last been settled, that the train lighting rules have been brought up to date, that the work of the Tank Car Committee received the very strong indorsement of the association and that the association now has a very complete line of specifications covering paint materials.

Marseille-Rhone Canal and Rove Tunnel.—One of the three opening galleries of the Rove tunnel is completed the entire length (23,622 feet). The portion above the towpath is finished on half of the length. The canal ditch in the tunnel is not begun. Between Marseille and Port-de-Bouc the breakwaters in the Mediterranean and in the Etang de Berre are almost completed. Between Port-de-Bouc and Arles, the work begun before the war is being continued. The locks at Arles on the Rhone are built. The total cost of the canal is estimated at $17,756,000, including $10,615,000 for the Rove tunnel and its approaches. It is difficult to fix a date for the completion of the work as about one-third of the Rove tunnel is still unfinished.

Iron and Steel Business in Russia.—The following statistics show the orders received by the Russian "Prodamet" iron and steel selling syndicate during the first six months of 1914, 1915, and 1916:

Articles	Jan. 1-June 30, 1914. Short tons	Jan. 1-June 30, 1915. Short tons	Jan. 1-June 30, 1916. Short tons
Sheet iron	183,169	149,846	115,919
Girders	158,130	106,034	11,529
Sleepers	36,198	33,543	21,759
Hoop iron	71,164	61,346	14,396
Angle, band and section iron	540,637	537,964	632,711
Rails:			
Light	27,900	13,862	51,517
Heavy	209,858	245,341	132,107
Total	1,227,056	1,147,936	979,938

Germans Rebuild Great Warsaw Bridge.—The great Poniatowski bridge across the Vistula at Warsaw, which was destroyed by the Russians when they evacuated the city in August, 1915, has been rebuilt by the Germans.

The Increases in Prices of Railway Material

The Advances in Cost of Most Necessities of Maintenance and Operation Range from 25 to 75 Per Cent

WITHIN the last two years there has been an advance in cost to railways of almost every class of material necessary to be used for purposes of maintenance and operation. The increase has in some instances amounted to several hundred per cent. In most of the staple articles of supplies the advances have ranged from 25 to 75 per cent. In many instances these percentages of increase are not as high as the railways would have had to pay but for the existence of long-time contracts made when prices were lower. Roads that were not in such financial condition as to permit the making of long-time contracts when prices were favorable have had to purchase at still higher rates of increase than are represented by these percentages.

The statistics recently published (*Railway Age Gazette,* September 22, page 482) showing the small increase in operating expenses in 1916, compared either with 1915, in which the increase in volume of business was only beginning, or with one of the best of previous years, 1913, before the late general depression in business had taken place, are all the more remarkable when taken in connection with these increases in cost of supplies. As shown by the returns to the Interstate Commerce Commission for the fiscal year 1916, an abstract of which was published in the *Railway Age Gazette* of September 22, operating expenses for 1916 increased 8.6 per cent compared with 1915 and 1.4 per cent compared with 1913. Yet in the two years between the close of the fiscal year 1914 and the close of the fiscal year 1916 there were increases in cost of nearly every item of material. These increases, particularly in such items as are the staples of railway supplies, range from a small percentage up to 700 per cent in some parts of the country. In the aggregate, and taken in connection with advances in the cost of labor, the increases must have amounted to a much greater percentage than the slight increase shown in the total amount of operating expenses in this period. The small increase in operating expenses in 1916 therefore offers a direct confirmation of the success of the efforts universally put forth to secure greater efficiency in operation.

Some few roads, largely for the purpose of impressing upon officers and employees the necessity of restricting purchases and conserving use as far as possible consistent with efficiency and with maintaining property in condition for safe operation, have issued statements showing increases in the current market price of supplies that have taken place from time to time. In March, 1916, W. C. Nixon, receiver and chief operating officer of the St. Louis & San Francisco, issued a statement showing by items 70 staple articles of supplies upon which increases in cost ranging from 10 to 80 per cent had taken place as compared with the preceding year, and a list of 35 articles on which, during the same period, increases ranging from 80 per cent to 700 per cent had taken place. The average increase in the current market price of all the articles mentioned, and not including the large items of rails, ties, ballast and fuel, was 53.6 per cent. On the St. Louis & San Francisco the purchases of the articles listed amounted to $3,314,753. If the quantities of the same supplies purchased during the current year were equal to the quantities purchased during the preceding year, the total cost would amount to $5,091,460, or an increase of $1,776,707.

In his suggestions as to the practical application of the knowledge of these great advances in prices, Mr. Nixon outlined what has doubtless been the policy followed by other railway managers and which is reflected in the statement of the small increase in operating expenses relative to the increase in the amount of business handled. To officers of the road he said:

"In considering this matter for the territory in your charge, you may find structures and facilities which it would ordinarily be better fully to renew than to repair in part, because the expenditure necessary to make sufficient repairs would go a long way toward covering the cost of complete renewal. A careful analysis may develop, however, that, considering the prevailing excessive prices of material, we would be better off if we made partial repairs at the present time instead of undertaking a complete renewal. . . . Other betterment work that is in contemplation may, perhaps, have to be deferred, even though such action at this time may increase our operating costs. An analysis of such situations may develop that we can better afford to incur increased operating costs rather than to furnish new or additional facilities at this time on account of the excessive cost of the necessary material."

For his purposes, however, Mr. Nixon selected the items of supplies on which the advances in prices had been greatest. Advances in prices have doubtless varied in amount in different sections of the country and, perhaps, with different roads in the same section. For the purpose, therefore, of determining approximately the extent to which the railways of the whole country have been affected by the general advance in prices, and particularly by the advance in prices of representative articles that may be considered as the staples of railway supplies, the *Railway Age Gazette* has undertaken a more extended investigation. A list was prepared, without reference to the advances that might be assumed to have taken place in their current price, of such articles and submitted to several representative roads in different sections.

Ten roads have furnished information based upon prices paid for the articles named as of July 1, 1914; July 1, 1915, and July 1, 1916. The roads from which returns have been received represent an aggregate of 55,000 miles, three being roads in the eastern section of the country with a mileage of about 12,000 miles, six being in the western section and having about 38,000 miles, and one in the southern section, representing about 5,000 miles.

The success of the attempt to make the selection of articles as fully representative as possible within narrow limits as to number rather than to confine the representation to articles upon which advances in price are known to have been large is, perhaps, a fair assumption from the inclusion in the list of some items upon which the advance has been small. In two or three instances there has been a reduction in cost in 1916 as compared with 1914. These slight advances or reductions may be accounted for in various ways. In the statement of average increase for the ten roads included only two items, air-brake hose and lubricating oil, show actual reductions. With reference to both these articles it is fairly to be assumed that prices have been made upon the basis of long term contracts. In the case of lubricating oils it is stated specifically in some of the returns that lubrication is under contract with the Galena Oil Company. The small advance in the cost of illuminating oil may be similarly accounted for. Coal, such as is used for railway fuel purposes, is not subject to great fluctuations, partly for the reason that in many instances the supply is local to the road using it. Track shovels are the only other items on which the percentage of increase is so small as to be an exception to the general rule. Doubtless this could be accounted for by

the small amount of material relative to the amount of labor involved in the manufacture of track shovels and by the fact that no large increases have taken place in the wages of this labor. The date when contracts were made and their duration have had an appreciable effect in varying the percentages of advance developed from the prices reported by different roads.

The percentages of increase in cost of the articles named from July 1, 1914, to July 1, 1916, for all the roads included in the calculation and for the three eastern roads, the six western roads and one southern road, in separate groups, are presented in the accompanying table.

INCREASE IN COST OF CERTAIN ITEMS OF RAILWAY MATERIAL, JULY 1, 1914, TO JULY 1, 1916

	United States. Average increase, Per cent (10 roads)	Eastern District. Average increase, Per cent (3 roads)	Western District. Average increase, Per cent (6 roads)	Southern District. Average increase, Per cent (1 road)
Gravity battery renewals	66	38	74	116
Steel castings	32	39	28	38
Portland cement	18	28	12	25
Wire fencing	43	13	66	20
Glass	34	34	39	12
Air brake hose	—4	—4	—4	—5
Bar iron	100	95	103	102
Coal	5	9.5	2	3
Bridge stringers	36	17	48	21
Car siding	26	22	30	20
Lubricating oil—car	—2	—2	1	..
Linseed oil	27	27	28	25
Illuminating oil	9	—1	9.7	29
Cast iron pipe	34	39	31	39
Track shovels	2	1	5	—8
Stationery	58	80	47	..
Babbitt metal	81	56	100	79
Fabricated deck plate girders	82	67	83	123
Malleable castings	31	15	35.5	58
Brass	90	144	74.5	73
Boiler flues	74	88	68.5	64
Gasoline	78	87	78	54
Rivets	120	156	113	60
Tool steel (h. s.)	466	495	484	323
Tieplates	84	77	87	92
Waterproof insulated line wire	73	107	48	96
Cotton waste	52	65	40	80

Percentages and averages in studies of this sort are, perhaps, chiefly useful as showing to what extent the tendency of which they are illustrative is general for the country, for a district or for a single item among those under consideration. For the purpose of exhibiting the actual fluctuations in prices more in detail, there are presented herewith reproductions of the actual returns as they were received from the various railways reporting, omitting only the name of the road in each case for reasons which are obvious. The following are the returns from eastern roads:

EASTERN DISTRICT

ROAD A

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.05	$1.30
Steel castings, cents per lb.	2.6 to 6.1	2.6 to 6.1	3.4 to 8.5
Portland cement, per bbl.	$1.36	$1.15	$1.74
Wire fencing, per cent disc. list	75	74½	62½
Glass, coach, per light	$1.45	$1.50	$2.30
Air brake hose, cents per ft.	42	30	40
Bar iron, cents per lb.	1.35	1.30	2.50
Coal—			
Bituminous, net ton	$1.12	$1.12	$1.21
Anthracite, gross ton	$2.66	$2.48	$2.58
Bridge stringers, per M. ft.	$36.00	$36.00	$39.50
Car siding, per M. ft.	$19.25	$19.25	$24.00
Lubricating oil—			
Air compressor, cents per gal.	30	30	32
Stationary engine oil, cents per gal. (Equipment lubricated under mileage contract.)	22½	22½	25
Linseed oil, cents per gal.	47½	60½	65
Illuminating oil, cents per gal.	1.28 to 1.44	0.906 to 1.065	1.12
Cast iron pipe, per ton	$20.50	$21.00	$26.50
Track shovels, per doz.	$5.90	$5.50	$5.75
Stationery (index figures)	516	672	928
Babbitt metal, cents per lb.	39	45	54½
Fabricated deck plate girders, cents per lb.	1.96	2	4
Malleable castings, cents per lb	3.20 to 5.85	3.20 to 5.85	4 to 7½
Brass (rods), cents per lb.	13½	27	40
Boiler flues (steel, 2 in. No. 11) cents per ft.	8½	8½	16
Gasoline, cents per gal.	12	12	25
Rivets, cents per lb.	1.45	1.45	4
Tool steel (high speed) cents per lb.	50	65	$3.00
Tie-plates, cents per lb.	1.45	1.30	2.50
Waterproof insulated line wire, cents per lb.	15.55	20.55	30
Cotton waste, cents per lb.	6½	6	10¼

ROAD B

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.13	$1.45
Steel castings, cents per lb.	2.39 to 7.29	2.75 to 7.50	3.18 to 8.29
Portland cement, per bbl.	$1.36½	$1.33	$1.50½
Wire fencing, per cent disc. list	77.50	76.125	72.50
Glass, per cent disc. list	94.906	95.00	93.125
Air brake hose, cents per ft.	42	26	30
Bar iron, cents per lb.	1.15	1.25	2.35
Coal, per ton	$0.989	$1.00	$1.075
Bridge stringers, per M. ft.	$27.15	$26.25	$29.00
Car siding, per M. ft.	$22.00	$21.00	$22.00
Lubricating oil, valve, cents per gal.	50	50	50
Linseed oil, cents per gal.	50	54	61
Illuminating oil, cents per gal.	4.00	3.25	4.75
Cast iron pipe, per ton	$21.00	$22.00	$27.75
Track shovels, per doz.	$6.00	$5.00	$5.85
Stationery	.....	.....	.....
Babbitt metal, cents per lb.	5.40	10.90	9.75
Fabricated deck plate girders, cents per lb.	2.05	2.15	3.70
Malleable castings, cents per lb.	3.75	3.40	4.00
Brass	.....	.....	.....
Boiler flues, cents per ft.	9¼	9	17¼
Gasoline, cents per gal.	12¾	9	20
Rivets—			
S, cents per lb.	1.40	1.40	4.00
B, cents per lb.	1.50	1.45	4.10
Tool steel (high speed), cents per lb.	.65	.45	$2.95
Tie-plates, per ton	$24.00	$24.00	$45.00
Waterproof insulated line wire, cents per lb.	14.30	19.00	30.00
Cotton waste, cents per lb.	5.00	5.00	8.00

ROAD C

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$0.90	$0.95	$1.25
Steel castings, per lb.	0.04	0.04	0.0615
Portland cement, per bbl.	1.00	1.10	1.45
Wire fencing, per rod	0.18	0.20	0.20
Glass (plate)	0.085	0.07	0.12
Air brake hose, per ft.	0.30	0.33	0.40
Bar iron, per cwt.	1.28	1.28	2.50
Coal per ton	2.82	2.75	3.15
Bridge stringers, per M. ft.	26.00	23.75	25.00
Car siding, per M. ft.	24.00	24.25	34.00
Lubricating oil (car), per gal.	0.1842	0.1862	0.16
Linseed oil, per gal.	0.52	0.50	0.63
Illuminating oil (kerosene), per gal.	0.066	0.057	0.065
Cast iron pipe, per ton	25.00	37.00	39.00
Track shovels, per doz.	7.85	6.77	8.45
Stationery	.....	.....	.....
Babbitt metal, per cwt.	29.75	37.95	44.10
Fabricated deck plate girders, per lb.	0.0317	0.0364	0.0372
Malleable castings, per cwt.	3.75	3.80	4.10
Brass, per lb	0.14¾	0.15½	0.28¼
Boiler flues, per ft.	0.09½	0.09	0.18
Gasoline, per gal.	0.11 4/10	0.11¼	0.22¼
Rivets, per cwt.	1.76	1.82	3.85
Tool steel—			
Carbon, per lb.	0.11	0.12	0.18
High speed, per lb.	0.41	0.41	3.00
Tie-plates, per ton	28.30	28.00	48.50
Waterproof insulated line wire, per lb.	0.14¼	0.20½	0.31½
Cotton waste, per lb.	0.045	0.045	0.08

With reference to the statement of Road A, the general observation is made that "we are still getting in some materials at lower figures which we contracted for when prices were lower, but as there is no appreciable tendency toward falling prices the figures I give you represent fairly what our company has to expect. The advance in prices is not the only thing that has caused the increase in the cost of supplies, especially in the value of stock which must be carried on hand. The difficulty of getting materials promptly from the manufacturers and mills and the delays we are subjected to in waiting for the delivery of materials ordered even long ago makes it necessary for us to carry a larger stock than if deliveries were prompt and the getting of material were more flexible than it is. For the same reason, also, we have to take materials from the manufacturers sometimes before we actually want it in order to get it at all, and have to carry a stock predelivered thus at expense to ourselves."

Road C says "the figures illustrate pretty fairly what has transpired in the material market during the past year, and there seems at present no sign of abatement. There have, indeed, been some further increases in price since July 1."

Considered generally, and taking into account that in the case of individual items there are occasional wide divergences in the prices paid by the different roads and in the increases that have taken place from 1914 to 1916, by reason of long-standing contract arrangements, there is, nevertheless, displayed a remarkable similarity of tendency, not only as between roads in the same section, but as between the roads in the two sections. The tendency toward increased prices is general and touches the same items with much the same

degree of intensity in the two sections. This will appear from the detail statements of western roads which follow:

Western District

Road D

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$1.00	$1.11	$1.54
Steel castings, per cwt.	4.10	3.95	5.95
Portland cement, per bbl.	0.90	0.80	1.25
Wire fencing, per rod	0.2115	0.2185	0.5375
Glass (20 in. by 30 in. D. S. A.) per box	3.27	3.27½	5.45
Air brake hose, per ft.	0.32	0.33	0.40
Bar iron, per cwt.	1.25	1.20	2.35
Coal, per ton	1.642	1.648	1.649
Bridge stringers (Long Leaf Y. P.), per M. ft.	21.00	24.00	35.75
Car siding, per M. ft.	22.75	21.00	22.50
Lubricating oil—			
Car oil, per gal.	0.1988	0.1996	0.1996
Valve oil, per gal.	0.4988	0.4996	0.489
Linseed oil (boiled), per gal.	0.51½	0.54	0.68½
Illuminating oil—			
Headlight	0.06½	0.02	0.089
Long Time Burner, per gal.	0.06	0.06	0.075
Cast iron pipe, per ton	17.80	20.00	25.00
Track shovels, per doz.	5.75	5.25	6.25
Stationery—Average increase in prices on articles standard to our stock	.....	.....	62.3 per cent over 1915
Babbitt metal, per cwt.	6.00	8.00	15.00
Fabricated deck plate girders, per cwt.	2.06	2.02	4.80
Malleable castings, per cwt.	3.50	3.35	6.00
Brass, per lb.	0.13875	0.19875	0.265
Boiler flues, per ft.	0.08½	0.07¾	0.16
Gasoline, per gal.	0.10	0.06¾	0.184
Rivets, per cwt.	1.775	1.60	3.65
Tool steel (high speed), per lb.	0.57½	0.50	4.00
Tie-plates, each	0.083	0.0795	0.19½
Waterproof insulated line wire, per cwt.	17.85	19.35	22.80
Cotton waste (colored), per lb.	0.04¼	0.038	0.06¾

Road E

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals, each	$0.99½	$1.12¼	$1.41
Steel castings, per cwt.	4.10	3.95	5.30
Portland cement—			
Sandusky, per bbl.	1.30	1.30	1.55
Universal, per bbl.	1.38	1.35	1.55
Wire fencing, per rod	0.2475	0.2475	0.27225
Glass, 20 in. by 20 in., per box	3.20	2.90	4.76
Air brake hose, per ft.	0.42	0.33	0.40
Bar iron, per cwt.	1.05	1.15	2.24
Coal—			
Iowa, per ton	1.92½	1.92½	2.02½
Lake, per ton	2.70	2.65	2.95
Illinois (Spring Valley), per ton	1.90	1.90	2.00
Bridge stringers, per M. ft.	23.20	21.70	23.70
Car siding, per M. ft.	23.50	21.00	27.00
Lubricating oil—			
Cylinder, per gal.	0.4831	*0.4840	0.4840
Car, per gal.	0.1831	0.1840	0.1840
Linseed oil, per gal.	0.47¾	0.64½	0.60
Illuminating oil (kerosene), per gal.	0.045⅜	0.03⅞	0.058
Cast iron pipe, per ton	21.55	23.11	29.11
Track shovels, per doz.	6.00	5.75	7.25
Stationery	.....	.....	.....
Babbitt metal, per cwt.	7.00	12.40	18.02
Fabricated deck plate girders, per cwt.	2.14	1.85	2.48 to 2.68
Malleable castings, per cwt.	2.90	2.85	4.20
Brass, red metal, per cwt.	14.91	17.54	26.52
Boiler flues, per ft.	0.08½	0.07¾	0.18
Gasoline, per gal.	0.11½	0.10½	0.18½
Rivets, structural steel, per cwt.	1.60	1.55	3.50
Tool steel—			
Carbon, per cwt.	0.05¾	0.05¾	0.08¼
High speed, per cwt.	0.45	0.40	2.75
Tie-plates, per ton	27.00	25.00	31.50
Waterproof insulated line wire, per cwt.	5.60	7.35	9.77
Cotton waste—			
White, per lb.	0.09	0.08	0.11½
Colored, per lb.	0.05	0.047⅛	0.08¾

*Increase account change in freight rate. Price same account five year contract.

Road F

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals (Edison), each	$0.994	$1.1376	$2.782
Steel castings, per cwt.	3.775	3.70	4.00
Portland cement (year's average), per bbl.	1.437	1.12	1.45
Wire fencing, per cent disc. from list	75	75	72½
Glass—			
Window, per cent disc. from list	94.75	95.15	92.2
Plate, per cent disc. from list	93.21	95.125	91.9
Air brake hose, per ft.	$0.50	$0.50	$0.50
Bar iron, per cwt.	1.30	1.20	1.855
Coal, per ton	1.727	1.621	1.698
Bridge stringers (fir), per M. ft.	23.20	21.50	25.20
Car siding (fir), per M. ft.	18.50	15.00	28.00
Lubricating oil, car, tanks, per gal.	0.18	0.1812	0.1812
Linseed oil—			
Raw, per gal.	0.51	0.53	0.66
Boiled, per gal.	0.52	0.54	0.67
Illuminating oil (headlight), per gal.	0.03½	0.02½	0.03
Cast iron pipe, per ton	23.40	23.40	30.15
Track shovels—			
Iron D, per doz.	7.00	5.25	6.25
Wood D, per doz.	6.50	5.25	6.25
Babbitt metal, per cwt.	16.75	16.75	16.75
Babbitt metal (special hard), per cwt.	22.00	22.00	22.00
Fabricated deck plate girders, per cwt.	2.15	2.20	3.83
Malleable castings, per cwt.	3.75	3.75	3.75 to 4.25
Brass castings, per lb.	0.16½	0.21	0.28¼
Boiler flues, per ft.	0.12½	0.12¼	0.12½
Gasoline, per gal.	0.076	0.0525	0.1575
Rivets, steel, per cwt.	2.40	2.20	4.00
Tool steel—			
Carbon, per lb.	0.07	0.07	0.0875
High speed, per lb.	0.50	0.50 to 1.60	2.75
Tie-plates, per net ton	25.75	23.40	45.00
Waterproof insulated line wire, per M ft.	15.50	12.32	19.35
Cotton waste (colored), per lb.	0.05⅜	0.05⅜	0.06⅜

Road G

	July 1, 1915 Per cent over July 1, 1914	July 1, 1916 Per cent over July 1, 1914
Gravity battery renewals—		
Zinc	250	133
Copper	20	30
Steel castings, 100 lb. to 250 lb.	None	30
Portland cement	5 dec.	None
Wire fencing	8	80
Glass (window)	16	30
Air brake hose	30 dec.	25 dec.
Bar iron	15	130
Bridge stringers	5 dec.	33⅓
Car siding	25	60
Lubricating oil (car)	None	None
Linseed oil (boiled)	None	30
Illuminating oil (headlight)	33⅓ dec.	None
Cast iron pipe	1	25
Track shovels	None	4
Stationery	10	33⅓
*Babbitt metal (anti-friction)	14	15 dec.
Fabricated deck plate girders	3	60
Malleable castings	None	45
Brass	15	90
Boiler flues (charcoal iron)	None	75
Gasoline	25 dec.	100
Rivets	3	130
Tool steel—		
Carbon	None	50
High speed	150	550
Tie-plates	None	100
Waterproof insulated line wire	6 dec.	None
Cotton waste	10 dec.	10

*Decrease in 1916 partly due to change in specifications.

Road H

	Percentage of increase or decrease July 1, 1915, over July 1, 1914	Percentage of increase or decrease July 1, 1916, over July 1, 1914
Gravity battery renewals—		
Zincs, per 100	67	137.4
Coppers, per 100	3	32
Steel castings, per lb.	....	33.3
Portland cement, per bbl.	....	....
Wire fencing—		
Galvanized barbed, per 100 lb.	13.5	78
Annealed fence, per 100 lb.	4	92
Painted barbed, per 100 lb.	3.4	79
Galvanized fence, per 100 lb.	15.2	87.9
Glass—		
Plate	11	47
D. S. A.	No change	20
Air brake hose, per ft.	—23	—14
Bar iron, per 100 lb.	16.5	142.7
Coal, per ton	—1.6	3.8
Bridge stringer I-beams, per lb.	2.7	97.3
Car siding, per M ft.	—22.7	23
Lubricating oil	5	5
Illuminating oil, per gal.	—4.7	14.5
Linseed oil, per gal.	4.8	22.3
Cast iron pipe, per ton	—6.9	32.9
Track shovels, per doz.	....	4
Stationery	(*)	(*)
Babbitt metal, per 100 lbs.	131.6	93.5
Fabricated deck plate girders, per lb.	2.7	97.3
Malleable castings, per lb.	—2	12.5
Brass—		
Journal bearings, per lb.	8.86	99.2
Brass castings, per lb.	7.71	84.6
Motor car castings, per lb.	6.45	70.8
Boiler tubes—		
Charcoal iron, per ft.	—5	....
Steel, per ft.	—8.8	41.2
Gasoline, per gal.	—28.9	36.1
Rivets, boiler, 100 lb.	....	134.3
Tool steel, per lb.	....	37.5
Tie plates, flat bottom, per ton	—8.4	90.8
Waterproof insulated line wire, per ft.	30.3	112.7
Cotton waste, per lb.	—10	35

*It does not seem possible to give a fair average of the increase in stationery. Some papers have been withdrawn and others have advanced from 25 per cent upward proportionate to quality. On account of shortage of dye price of inks enters vitally into this item and prices vary so as to make a fair average of increase seem incalculable.

Road I

	July 1, 1914	July 1, 1915	July 1, 1916
Bar steel, per cwt.	$1.31¾	$1.46¾	$2.229
Pig lead, per cwt.	4.20	6.00	7.35
Chain, ⅝ in. link, per cwt.	2.30	2.50	4.60
Sheet copper, per lb.	0.19¼	0.24	0.55
Nails, per cwt.	1.55	1.50	2.55
Oxalic acid, per lb.	0.08½	0.25	0.73
Muriatic acid, per cwt.	1.67	1.90	5.00
Galv. sheets, per cwt.	2.41¾	3.55	4.32
Building paper, tarred, per cwt	1.45	1.40	2.95
Steel castings, 51 lb. to 100 lb.	4.00	3.90	5.00
Portland cement, "Universal," per bbl.	1.57	1.58	1.85
Bar iron, per cwt.	1.19	1.275	2.25
Bridge stringers, per M. ft.	9.00	8.00	16.00
Cast iron pipe, per ton	25.05	24.95	31.30

	July 1, 1914	July 1, 1915	July 1, 1916
Fabricated deck plate, girders, per cwt..	2.09	2.27	4.35
Brass, general machinery, per cwt.....	16.208	19.0833	20.6666
Boiler flues, per ft.....	0.10¼	0.1038	0.20
Rivets, cone head ½ in. and larger, per cwt.	1.73¾	1.58¾	3.85
Tool steel, high speed, per lb.....	0.75	0.75	3.00
Tie plates, per ton.....	24.60	24.00	50.00

Road F comments as follows upon the statement presented above:

"Most all railroads have contracts and these prices do not reflect the current prices as of July 1. They were made prior to that date. Take, for example, our boiler tubes—the price is nearer 20 cents. Track shovels are under contract prior to July 1. This is also true all the way through, except possibly on tie plates, which price is $5 under the market, and cast-iron pipe, which is about the market.

"I have not filled in the blank as to stationery because I don't know how to do it and reflect anything of value."

In the face of constantly advancing prices, as appears to be the case with many of the items included in the list, the inference from the above statement is that the average of increases is rather above than below what is shown in the foregoing returns. The effect of long-time contracts, made two or more years ago, has been to reduce the percentage of increase reported.

The purchasing officer who reports for Road H calls attention to several items not included in our list upon which there have been material increases in cost. Among these he mentions tie preservatives, such as creosote and chloride of zinc; track accessories, such as bolts, nuts and spikes; also rails, which have increased $5 per ton, as well as billets, bars, beams, angels, rods, copper, spelter, tin, lead, antimony, pig iron, ferro-manganese and tank plates. These affect and increase the cost of many items essential to railway operation.

The same officer also adds a statement of the rate of increase in cost of some of the larger items of equipment, comparing prices in 1916 with those in 1913. These are as follows:

Mikado locomotives	10 per cent
Flat cars	10 per cent
Gondolas	13 per cent
Stock cars	5 per cent
Box cars	6 per cent
Steel coaches	9 per cent

Southern District

A report has been received from one southern road. The returns follow rather closely the averages of returns from eastern and western roads. The statement in detail follows:

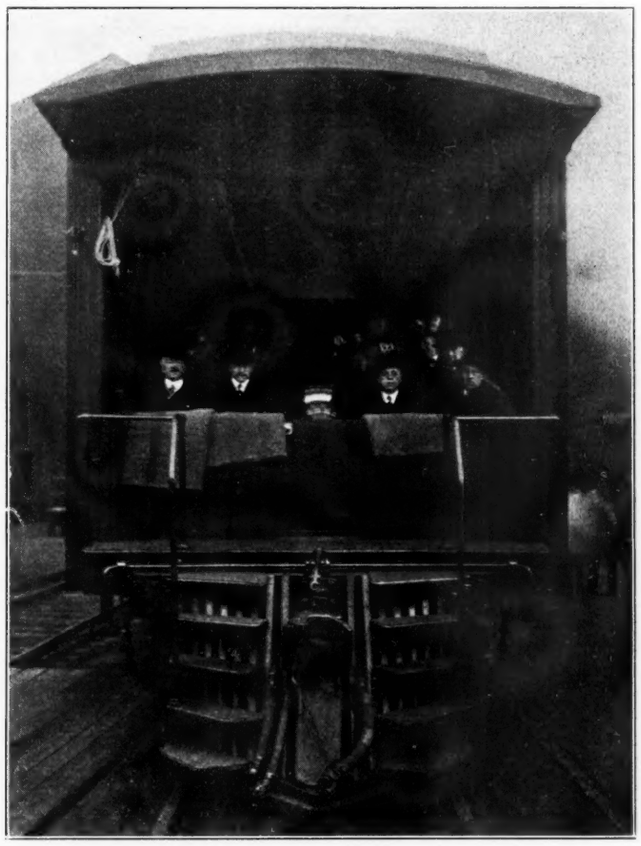
Road J.

	July 1, 1914	July 1, 1915	July 1, 1916
Gravity battery renewals—			
Gravity copper, per 100.....	$5.50	$6.25	$7.25
Gravity zincs, per 100.....	34.75	81.75	67.75
Blue vitriol, per cwt.....	4.60	6.00	10.75
Steel castings, per net ton.....	66.00	64.00	91.00
Portland cement (including bags), per bbl.	1.24	1.30	1.55
Wire fencing, disc. per cent.....	75	70	62½
Glass, disc. per cent.....	93.1	93.5	92
Air brake hose, per ft...	$0.42	$0.29½	$0.40
Bar iron, per cwt.....	1.04	1.15	2.10
Coal, lump and egg, per ton.....	1.50	1.35	1.55
Bridge stringers, per M. ft.....	19.50	21.50	23.50
Car siding, per M. ft.....	20.00	23.00	24.00
Linseed oil, per gal.....	0.51	0.465	0.64
Illuminating oil, kerosene, per gal.....	0.0350	0.02375	0.045
Illuminating oil, signal, per gal.....	0.26	0.2812	0.2812
Cast iron pipe, per ton.....	18.00	18.00	25.00
Track shovels, per doz.....	6.25	5.75	5.75
Babbitt metal, per cwt.....	5.10	11.25	9.15
Fabricated deck plate girders—			
Tank plates, per cwt.....	1.10	1.10	3.44
Steel beams, per cwt.....	1.12	1.20	2.50
Malleable castings, per cwt.....	2.85	3.50	4.50
Brass castings, per lb.....	0.15	0.20½	0.26
Boiler flues, per ft.....	0.09¾	0.09¾	0.16
Gasoline, per gal.....	0.12	0.09½	0.18½
Rivets, B. H., per cwt.....	2.20	2.00	3.50
Tool steel, per lb.....	0.65	1.00	2.75
Tie plates, per net ton.....	26.00	26.00	50.00
Waterproof insulated line wire, per cwt.	15.30	17.75	30.00
Cotton waste (colored), per lb.....	0.05	0.05	0.09

Not all roads have been in so good position as have the larger systems, whose reports are given to make long-time contracts for supplies. It would seem, therefore, that in estimating the effect of increased costs of supplies upon the operating expenses of the railways of the country as a whole, a considerably higher percentage should be applied to most of the items.

THE FORTY-FOURTH ANNUAL TRACK INSPECTION OF THE PENNSYLVANIA

The forty-fourth annual track inspection of the main line of the Pennsylvania between Pittsburgh and New York was made on October 3 and 4. This annual inspection as made by the general manager of the Pennsylvania has grown from a small beginning, to be a permanent important institution of the road. At its inception, nearly fifty years ago, the trip was made only by the employees and officers of the maintenance of way department, but with the increasing realization of the benefits derived from a trip of this nature, the party has been increased by invited guests from other depart-



Interior View of the General Manager's Inspection Car

ments to such an extent, that on the occasion of the forty-fourth annual inspection, the general manager was accompanied by more than 300 operating officers. As an institution, and in point of numbers attending, it ranks with the national conventions held by various societies and associations throughout the country, and offers even a greater opportunity than conventions for discussion and the interchange of ideas.

To fully understand the beneficial results of these inspection trips, it is necessary to have a clear understanding of the organization of the maintenance of way department, which has the general manager as its chief officer. Each division superintendent has a division engineer on his staff.

The superintendent reports to a general superintendent, who, in turn, reports to the general manager. The engineer of

maintenance of way also reports to the general manager, and on his staff has three assistants—the assistant engineer in charge of roadway and track, the assistant engineer in charge of structures, and the signal engineer.

The division engineer is the recruiting officer for the corps of maintenance engineers and employs only graduates from engineering colleges of recognized standing. These men make up what is known as the classified service.

The division engineer is in charge of all maintenance on his division and to him report the master carpenter, the supervisor of signals and the supervisors of track. These men are chosen from the classified service after some years of preliminary training and are always under the personal observation of their superiors, and are in constant training for the more responsible positions, it being the almost unvaried custom of the road to fill all positions of responsibility in the maintenance of way department from the men who have come up in the classified service.

The inspection party, while including many of the higher officers, is largely made up of these men of the classified service, in training for the more responsible positions and the management considers these inspection trips to be a vital step in their development. This trip presents the opportunity for them to become acquainted with their superior officers and the men of similar rank, acquaints them with their railroad, broadens their outlook, enables them to discuss methods with others and to see how the other fellow is meeting his difficulties. It promotes a spirit of good fellowship and co-operation, so essential to the successful operation of a railroad or other corporation.

On October 2, the members of the inspection party, made up of representatives from all divisions east of Pittsburgh, including the branch lines, gathered at Pittsburgh and were assigned hotel accommodations as guests of the Pennsylvania. They had previously been furnished with the itinerary of the trip, showing train schedules and information as to the seating arrangement on the special trains.

The inspection train was made up in six sections, comprised of inspection and business cars. The inspection cars are of special design with the seats arranged in tiers, one above the other in grandstand style, each car seating 30 persons. Ample space is provided in the rear for baggage. Each section, excepting the first, carried two of these cars, one being pushed ahead of the locomotive and the other placed on the rear.

As the members of the party found their seats in the inspection cars, they were assigned to one of the four inspection committees. These committees were furnished with blank forms on which to record their observations, and, as may be seen in the accompanying illustration, committee No. 1 had to do with the line and surface of the main line track; committee No. 2, with ditches, ballast and spacing of ties; committee No. 3, with sidings, road crossings, station grounds and the policing; committee No. 4, with the switches and signals.

The members of the committees were furnished with one of these blank forms for each supervisor's division between Pittsburgh and New York, or eighteen blanks in all. Each member of the various committees was expected to assign figures to the best of his ability for the various items covered, and, at the conclusion of the trip, to forward the marked blanks to the office of the general manager. To avoid confusion of one supervisor's division with another, one man on each inspection car was assigned to watch out for the markers indicating the division line between sections, and, as it was passed, a gong, placed at the front of the car, was rung to notify the committeemen.

As these marked cards are received at the general manager's office, they are sent to the drafting room, where a chart is made, showing the results of the inspection trip. Copies of these charts are then sent out to the general superintendents, division superintendents and division engineers. When the division engineer receives his copy the supervisors are called in conference and plans are made to correct the faults indicated on the chart.

The start was made from Pittsburgh at 9.03 A. M., on October 3, as the first section moved out of the station followed, at intervals of two minutes, by the remaining five sections. As the several trains passed through the yards, the party was greeted with cheers from employees and citizens collected at all points of vantage along the right of way. This enthusiasm was not confined to Pittsburgh alone, but continued throughout the trip, and was one of its most remarkable features.

A Track Gang Saluting the General Manager and Party

The territory between Pittsburgh and Harrisburg was covered on the first day, two stops being made during the run. The first stop was made at the famous Horseshoe Curve, where a photograph was taken of the various sections of the train. The second stop was made at Altoona, where lunch was served. Here the party was entertained by a concert given by the shop band.

On arrival at Harrisburg, the inspection party assembled at the board of trade building, to witness the awards of the special main line track inspection premiums. These awards are made independently of the annual track inspection and are based on the reports of inspections made during the year by the special main line track inspection committee, which for 1915-16 was comprised of: W. G. Coughlin, engineer maintenance of way, chairman; A. B. Clark, assistant engineer maintenance of way; L. W. Allibone, superintendent Sunbury division, and J. K. Johnston, superintendent Tyrone division.

The prizes are six in number and total $5,400. The first, or Klondike prize, amounts to $1,200, $800 for the supervisor and $400 for his assistant, and is awarded for maintaining the best section of tracks throughout the year. This prize was presented to C. M. Wisman, supervisor, and H. M. Grimm, assistant supervisor, who had charge of the section between Liddonfield, Pa., and Plainsboro, N. J.

The special improvement prize of $1,000, $700 to the supervisor and $300 to his assistant, was awarded to J. E. McIntyre, supervisor, and W. W. Portser, assistant supervisor, in charge of the section from Anderson to Thompsontown, Pa. This prize is for the greatest improvement made in the line and surface of a supervisor's section during the year.

PENNSYLVANIA RAILROAD COMPANY

New Jersey Div. New York Div.

REPORT OF CONDITION OF SUPERVISOR'S DIVISION No. A.

R. J. BOND, Supervisor
H. R. GEIB, Assistant Supervisor
1916

SUB-DIVISION FOREMEN	COM. No. 1		COM. No. 2			COM. No. 3			COM. No. 4	
	Main Tracks									
	Line	Surface	Ditches	Ballast	Spacing Ties	Sidings	Road Crossings	Station Grounds & Policing	Swtchs.	Signals
8 Jas. Foran										
7 C. F. Coyne										
6 Jas. Keegan										
5 Michael Crecca										
4 T. M. Dunning										
Total										
Average										

EXPLANATION

COMMITTEE No. 1—Mark the condition of line and surface of all running tracks.

COMMITTEES Nos. 2 and 3—Mark the respective features with reference to their general appearance and conformity to standard requirements.

COMMITTEE No. 4—Mark frogs, switches and alignment through crossovers and turnouts. Mark Signals with respect to condition and adjustment; condition of pipe runs, wire conduits, switch connections, and general conformity to standard construction.

NOTE.—Use marks of merit ranging from 1 to 10; 10 denoting perfect condition; 5 medium; 1 very bad; intermediate numbers denoting intermediate conditions.

INSPECTED BY

(NAME) .....

(TITLE) .....

Form Used by the Inspection Committees

In addition to the special prizes, four prizes of $800 each, $600 to the supervisor and $200 to the assistant, were awarded for maintaining the best line and surface on a main line superintendent's division between Pittsburgh and New York, and Philadelphia and Washington. These prizes were awarded to C. Z. Moore, supervisor, and L. R. Fleming, assistant supervisor in charge of the section between Harrisburg and Dillerville, Pa.; W. R. Hanly, supervisor; B. M. Frymire, assistant, in charge of the section between Thompsontown and Marysville, Pa.; W. E. Brown, supervisor, and G. H. Stewart, assistant, in charge of tracks between New Florence and Donahue, Pa.; W. F. Reuch, supervisor, and A. G. Andrew, assistant, in charge of the section between Perryville, Md., and the Black River Bridge, north of Baltimore.

W. G. Coughlin, engineer maintenance of way, presided as chairman of the meeting, and C. H. Niemeyer, assistant engineer maintenance of way, in charge of road way and track, awarded the prizes. Thomas W. Hulme, real estate agent; H. W. Bekle, assistant general solicitor; H. M. Carson, general superintendent Central division; J. G. Rodgers, general superintendent Northern division; Ivy L. Lee, formerly executive assistant, and S. C. Long, general manager, were the speakers of the evening.

A Section of the Inspection Train Passing Newport, Pa.

On October 4, the trip was continued, covering the territory from Harrisburg to New York, the various committees carrying on their work as on the preceding day. A short stop was made at Overbrook, Pa., to receive box lunches prepared at the Broad Street Station, Philadelphia. On arrival at Manhattan Transfer, the party was transferred from the inspection cars to electric trains for the trip to the Pennsylvania Terminal at New York, where dinner was served in the grill room.

GREAT WESTERN'S ACCIDENT RECORD.—It is three years since the last train accident on the Great Western of England in which a passenger was killed. Since the Slough accident of 1900 there have only been four train accidents on that line in which passengers have been killed, viz., Loughor (3 killed) in 1914, Taunton (1 killed) in 1907, Westbourne Park (1 killed) in 1911, and Yeovil (3 killed) in 1913. In the year 1913 the Great Western carried 109 million passengers, the highest number of passengers of any railway in the United Kingdom.

RAILWAY FIRE PROTECTION ASSOCIATION

An account of the opening sessions of the annual meeting of this association, held in New York City, October 3, 4 and 5, and of the reports on fire prevention in grain elevators and on automatic sprinklers, was given in the *Railway Age Gazette* last week; page 602; there remain to be noticed the reports on locomotive spark and ashpan hazard, on electrical hazards and on the protection of wharves and piers; and also papers by Robert Scott (A. C. L.) on shop property and by President F. H. Elmore (Southern Railway) on statistics.

Locomotive Spark Hazards

This report was presented by W. F. Kaderly, (G. S. & F.). The committee has made a study of locomotive front end appliances, but refrains from recommending any one because of strongly divergent views, among officers consulted, as to merits; and also because experiments are still going on. The Master Mechanics' standard front end, and the Mudge-Slater device are well-recommended. One road reports encouraging success with a device by which cinders are conveyed from the front end of the engine back to the firebox. The principal recommendation of the committee is that front end arrangements should be thoroughly inspected after each trip, and that the inspectors should be men thoroughly familiar with the apparatus; and a daily record should be kept of the condition of engines. Of ashpans, the most popular designs are the double sloping pan and the sliding hopper-bottom pan. Here, also, the principal recommendation is for thorough inspection at the end of each trip. These recommendations, if carried out, will greatly reduce the danger of setting fire on adjacent property. The committee says that the right of way should be burned off at least twice a year; and in heavy forests there should be fire guards fifty feet from the track. Where old ties are burned along the road, the work should be completed early in the day; fires left burning when the men go home are a danger.

The discussion on this paper brought out the experiences of a number of members. The importance of the matter of inspection, as pointed out by the committee, was emphasized by many speakers. It is common to get reports of fires and find the netting, in the locomotive which is blamed, in apparently good condition. Sometimes, however, it will be found that sparks get out around the edge, which is loose; or the plates around the pipes are not well fitted. It was agreed that no single standard of mesh in netting could be settled on, as different coals demand differences in the size of opening. Perforated steel plates are used with satisfaction; they cost more than netting but it was believed that their added durability compensated for the extra cost. The device for returning cinders to the firebox, mentioned by the committee, is in use on switching engines of the Illinois Central; also on large freight engines. It is claimed that these engines have never set a fire.

P. Hevener, (Rock Island) reported satisfactory service with the Mudge-Slater device. It is in use on half of the coal burning locomotives of the Rock Island. The fire losses off the right of way have been reduced 50 per cent and the device is to be put on the rest of these engines. Another road reported that this device showed no marked improvement over other devices in use on the same road.

The association accepted the report as one of progress; and the committee was directed to study its problem in connection with the use of oil fuel and pulverized coal.

Electric Hazards

This report, presented by T. S. Potts, (C. H. & D.) consisted of a six-page tabular statement of the causes of hazards around electric installations used for power purposes, and in connection with signaling systems. The list includes all conceivable troubles with auto-starters, generators, lightning arresters, motors, rheostats, switchboards, signaling systems, storage batteries, transformers and wiring. After a very brief discussion the report was accepted.

Fire Protection on Wharves

This report, presented by W. F. Hickey, (N. Y., N. H. & H.) is a twelve-page essay on the construction of wharves, with special reference to safeguarding the structure and contents against fires. The principal hazard is internal, arising from the large quantities of combustible freight and the difficulty of getting fire apparatus to the seat of the trouble. The entire floor and platforms should be made of reinforced concrete, fireproof construction to be carried down to a safe distance below low water mark. Above the floor, fireproof construction would be heavy and costly; and heavy, smooth timbers are the best material. Wall covering should be of cement and asbestos, or some other completely noncombustible material. The roof should be noncombustible, on thoroughly protected steel or on heavy timber. Sheet metal and unprotected steel framework are undesirable, being quickly buckled by heat.

The height of sheds should be restricted as much as possible, and the space should be divided into maximum sections of 10,000 square feet. Subdividing walls, where made of wood, should be three or four inches thick, and solid; and sheathed with lock jointed metal, laid flat, with all nail heads covered. All fire doors should be labelled, and of the National Standard design. The space under the apex of wooden awnings over platforms should be divided, at least opposite each fire wall or partition. The division should be of metal, or 2-inch plank, and extend down to the lowest point of the awning. Windows should be of the thinnest possible glass with wire screens on the outside. The monitor roof should be a good ventilator and let out smoke; smoke is more troublesome than fire, many times.

Every pier should have standpipes fixed about 100 feet apart, each equipped with 50 feet of hose. Each standpipe should have two hose connections, one for 1½-inch hose, and one for 2½-inch, such as is used by fire departments.

The discussion on this paper dealt mainly with the relative merits of linen hose, unlined, and rubber lined hose. Linen hose is dried with difficulty, and salt water rots it. In handling the hose, after use, it is liable to be broken. One member had substituted rubber lined hose, because the unlined, by excessive friction, reduced the force of the stream. B. S. Mace (B. & O.), had found unlined hose objectionable because of leaking; at small fires, more damage is done by water than by fire. William McGrath, (D. L. & W.) uses cotton rubber-lined hose even in shops. E. W. Reilly, (Erie) believes that where the water pressure is low—40 lb.—it is more economical to use unlined hose and stand the expense of renewal when necessary. On his road there are places where the rubber rots sooner than the unlined.

Because of the varied views brought out in connection with the discussion on hose, and of the expression of many different opinions in connection with fire brigades and alarms, which were touched upon very briefly by the committee, the meeting accepted the report as one of progress, and requested the committee to take up again these two features of the subject.

Shop Property

The paper on this subject, by Robert Scott, superintendent of insurance of the Atlantic Coast Line, which is given in abstract below, was followed by a lively discussion concerning the inspection of shops and the duties of the fire-prevention department in connection with that work. Mr. Scott has weekly inspections and written reports, made by the fire chief or by a specially appointed person. At the Mount Clare shops of the Baltimore & Ohio, the shop foremen are required to go around criticising the conditions in the rooms of other foremen; this is done every week. J. S. Richards, (Southern Pacific, Houston, Texas) has a similar inspection

by foremen. A common difficulty, mentioned by several speakers, is the carelessness of men in leaving greasy clothing in a dangerous situation. A number of members said that greasy garments left by careless men were promptly burnt up. It is essential to require men to hang clothes properly in lockers. In one large shop a man goes around every noon, immediately after dinner, and picks up all loose papers.

The appointment of apprentices to positions in fire brigades, mentioned by Mr. Scott, was criticized as objectionable, because of the less responsible character of the younger men and the fact that each such man is likely soon to be transferred to some other place. It was replied to this that fire brigades should be made up of both old and new men. Each brigade should also have men from all of the different parts of a large plant. Mr. Scott was complimented highly on his paper.

Statistics

F. H. Elmore, president, reporting for the executive committee, gave data which has been gathered from 43 roads, out of the 60 holding membership in the association, 17 roads having failed to furnish any satisfactory response. The roads reporting operate 118,489 miles of line. The report for the year 1915 shows fires 5,123; loss $2,886,020, as compared with 5,900 fires in the preceding year with a loss of $3,795,197. This shows a reduction of 13.20 per cent in the number of fires, and 23.95 per cent in money loss. The seven most important causes in their order are: (1), locomotive sparks; (2), unknown; (3), tramps and trespassers; (4), adjacent property; (5), spontaneous combustion; (6), electric wiring, etc.; (7), wrecks. The number of fires under each head are, in their order: 1431, 920, 382, 293, etc. The seven classes aggregate 3,324 fires. Measured by the amount of loss, the fires from unknown causes stand at the head of the list, the losses amounting to 37 per cent of the total. Locomotive sparks caused less than 10 per cent; tramps and tresspassers, 6 per cent; spontaneous combustion, 8 per cent, etc. Classifying the fires in 1915 according to classes of property, 26 per cent were fires destroying or damaging rolling stock; 21 per cent elevators; 10 per cent merchandise in transit; 8 per cent passenger and freight depots and contents; 8 per cent shop buildings.

The tabular matter of this report is supplemented by a half dozen pages giving details of a number of important fires. In the case of one fire in a heap of coal, 20,000 tons of coal had to be moved to get at the fire. This fire is believed to have been caused by friction of wooden timbers at the bottom of the pile. In the case of a large office building, the circumstances were such that the inspectors concluded that a fire may be caused from the careless dropping of a cigarette, and yet not be discovered for a number of hours afterwards.

In the discussion on this paper, it was the sense of the meeting that the annual statement of losses by fire should show the destructible values of the property; and that the report should be for the fiscal year prescribed by the Interstate Commerce Commission.

Oil Burning Appliances

The committee on this subject, B. S. Mace, (B. & O.) chairman, presented a brief report containing a plan and very brief specifications of a proposed standard arrangement for installing a pressure tank for containing fuel oil. The plan contemplates a tank of a size to hold a half day's supply, for the shop to which it belongs, and a concrete pit large enough to allow the attendant ample space around the tank.

Fire Brigades, Inspection, Etc.

On Wednesday afternoon there was an informal discussion covering a variety of subjects. Rapid changes in the forces at various shops, terminals, etc., since the beginning of the European war have made it difficult to keep fire brigades well recruited. The thing to do, it seems, is to make special effort to see that the experienced men in brigades instruct the new men every day. At Locust Point, (B. & O.) Baltimore, there is a fire brigade of 22 men of whom 9 sleep on the premises and one is a patrolman on duty all night. The men who sleep at the terminal are off duty from 6 p. m. to 8 p. m. All of the 22 men have extra pay. Other speakers, who do not allow firemen extra pay, expressed the opinion that such allowance ought to be made. On the Southern Pacific, in Texas, one hour extra pay is allowed a man for each fire drill; and at fires, time-and-a-half is allowed. On the Erie, shopmen who are in the fire brigades are granted season passes.

The Erie has held a number of annual tournaments, with prizes, which have worked up a good degree of enthusiasm. There are now 20 fire companies on the Erie lines. This year, the employees' bands, organized at a number of cities on the line for musical recreation, went also to the tournament. This gathering was at Huntington, Ind., and 750 men were present. Enough men were left at home to protect the properties.

Fire Extinguishers

In a discussion of this subject it was brought out that in places where there is danger from oil fires, employees are likely to be very free in using extinguishers, and to leave them unfit for use at the next emergency. The foreman, in this case, going around the next day to replenish the extinguishers, calls the men together to observe what he is doing.

The observance of October 9 as fire prevention day, as recommended by the National Fire Protection Association, was the subject of a brief discussion. A number of members are acting in this direction, and co-operating with municipal officers.

The officers elected for the ensuing year are: President, P. Hevener, (Rock Island); Vice-President, B. S. Mace, (B. & O.); Secretary-Treasurer, C. B. Edwards, Seaboard Air Line, Norfolk, Va. Member of the executive committee in place of B. S. Mace, Robert Scott, (A. C. L.); members of executive committee to serve until 1919, F. H. Elmore, (Southern Railway) and W. S. Langford, (N. Y. C.).

Railway Shop Property

Many shop layouts are mainly comprised of buildings that have come into existence through some temporary arrangement, and not by reason of any well ordered plan.

The past record of fire losses on shop property should be sufficient argument for the use of fire-proof, or at least fire-resistive, material in the construction of buildings. Windows and wall openings should, of course, be protected by wired glass and automatic doors. In view of the ever increasing use of electric current for light and power, it is important that intelligent attention be given to the hazards arising from electrical equipment.

Administrative heads should see that a high order of discipline is maintained. That form of discipline is advocated which deals with teaching, instructing and training the mind rather than correction or punishment. To teach employees to have due regard for property rights there should be literature that can be easily comprehended. Such practices as smoking on the premises and the careless handling of oils and explosives should be regarded as offences that call for severe discipline, while a high degree of cleanliness and the very best of good housekeeping methods should be enforced.

Every shop plant should have ample pumping power, with pipes for delivering water in full force and volume to every part of the premises. In all buildings where automatic sprinklers can be used to advantage they should be installed, especially in the woodworking and upholstering departments, storehouses and pattern shops.

In the case of older plants it is well to examine this equip-

ment in order to make certain that the fire protection has kept pace with the growth of other facilities. This is an important feature which should be carefully looked after by those in charge of valuable properties. In selecting men for fire brigades young, vigorous and loyal apprentices usually meet the requirements. A general plan of all underground fire lines should be posted at some suitable place for study on part of the men. The fire alarm system must be reliable. The lapse of a few seconds may bring about conditions that render it impossible to control the flames.

So let us seek to awaken employees to a realization of the fact that the loss of facilities usually means lack of employment, and endeavor to impress upon the entire community that when railroad shops burn they are not always rebuilt in the same locality and that as taxpayers and payroll producers the roads are entitled to all the protection municipalities can afford to give them.

And let us drive home to our executives the conviction that the ever-narrowing margin between income and expense is improved every time a fire loss is averted; that the germ of fire can be controlled if the shop plant begins life with a sound constitution; if its premises are kept clean and free of unnecessary exposures, and a good circulation maintained by the application of energy in the right direction. We ask for no antitoxins, but earnestly plead for a plain and wholesome diet of unstinted co-operation and *water* in abundance.

COMMISSION REGULATION*

By Lewis B. Franklin.

Vice-President Guaranty Trust Company of New York

One of the most serious problems in which we are deeply interested and upon which the public needs educating is the relation of the state and federal governments to our great transportation systems. The regulation of public utility corporations by state commissions, now in effect to a greater or less extent in thirty-three states, has been accepted generally as wise and proper by the banker, the operator and the public. The reason for this approval by all classes is to be found in the fact that for the most part these state commissions have recognized the sound economic principle that regulated monopoly provides the best service to the public at the lowest rates commensurate with a fair return on the investment. The questions as to what constitutes a fair return and on what basis the value of the investment should be computed are still under discussion, but progress is being made from year to year in bringing the various commissions into harmony with each other and with the operators and bankers. As a matter of fact, the question of a fair return is not a theoretical question, but a very practical one. In the last analysis, a fair return must be one that will attract capital in sufficient quantities to provide adequate service, and this necessary return will fluctuate according to the price of capital for that class of undertaking in the market places of the world.

As regulated monopoly has become the practice in our municipalities, so regulated competition has been instituted in the relations of the federal government with our interstate transportation system. Federal regulation of railroad rates, both intra and inter state is, I believe, sound in principle and beneficent in practice, but it can never be practical to have our great transcontinental systems subject to one master as a whole and to forty-eight masters as to their several parts. The time is coming, and I trust is not far off, when the regulation of our railroads will be taken entirely out of the hands of the several state legislatures and placed where it belongs—in the hands of the Interstate Commerce Commission. Some of our legal friends may tell us that this cannot be done; that the sovereign power of the states granted them by the constitution cannot be taken away; that they must continue to supervise and control the corporations which they have created. Sovereign power was not given to each state without exception, but certain important functions were reserved solely for the federal government, including the control of commerce between the several states and the establishment of post roads.

*From an address before the Investment Bankers' Association fifth annual convention. October 2, 1916.

Constitutional Authority

It must be remembered that at the time of the adoption of the Constitution there was in the mind of none of its framers any conception of our modern systems of railroads, of telegraphs, or telephones or of steamships. Interstate travel was by post roads and over the establishment of such means of communication Congress was given power. This power was not limited to interstate roads, but was general in character, thereby indicating that intrastate transportation is only a part of interstate traffic and that control should not be divided but centered in the federal government. I firmly believe that had present conditions of transportation existed at that time, that sole power of regulation of all transportation would have been delegated to the federal government, and sincerely hope that this can be shortly brought about by federal legislation.

If it is proper for the government to establish railroad rates and, therefore, in a large degree, determine the gross revenue of the railroad corporations, is it not also proper that the same power should exercise supervision over such expenses as are subject to control? The trouble with the present system of regulation is that it is founded on the supposition that the railroad corporations are malign creatures of a corrupt money power and, therefore, repressive measures are the only ones needed. While there may in the past have been some warrant for this idea the time has come when our legislators must awake to an appreciation of the fact that the ownership of the railroads is in the hands of a great mass of the people and to the necessity of a constructive policy instead of a destructive policy. What a change in the attitude of the government since the days of the late sixties, when Congress was busily granting aid to the transcontinental lines reaching out across the western prairies! We do not want aid of that kind now, but we do want justice. We want intelligent action on these problems. We do not want legislation by compulsion—compulsion from the railroads, from the shipper or from labor, but a fair decision based on knowledge, not on supposition, on equity, and not on political expedience.

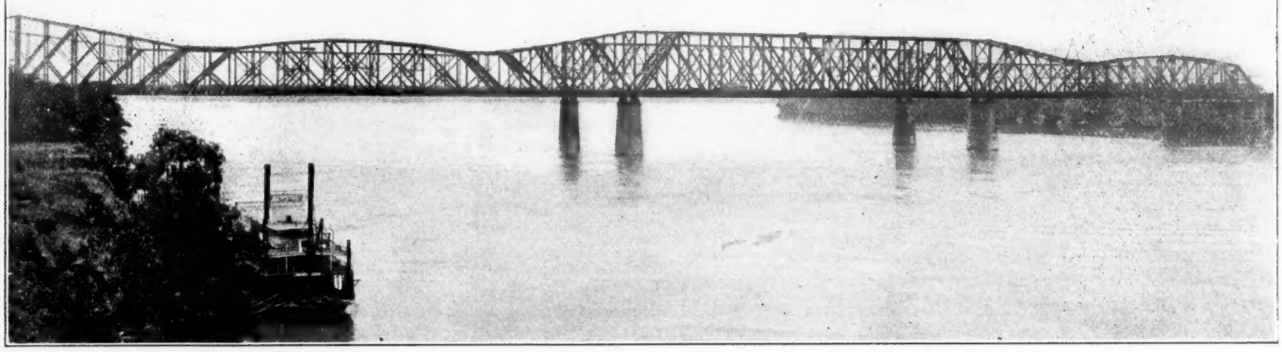
Federal Incorporation

It has seemed to many of those who have studied this question that compulsory federal incorporation of all railroad corporations doing an interstate business is the first step toward the solution of the problem. Our transportation systems are not less important to the country at large than is our national banking system and should even more logically come under federal control. A federal railroad board with regional boards constituted in a way similar to the federal reserve board, with federal incorporation, would, in my opinion, provide for our railroad systems stability, freedom from inexpert regulation and release from outside domination. Such intelligent supervision would lead to a restoration of confidence in railroad securities and thereby enable the companies to borrow money upon reasonable terms to provide funds with which to construct improvements necessary to good service and extensions whereby new territory can be opened up.

Germany's Pig Iron Output.—The German output of pig iron during August was 1,145,000 tons, as against 1,134,000 tons during July.

New Mississippi River Bridge at Memphis

High Water Interfered with Erection of Structure Which Was Placed in Service July 15. Mayari Steel Used



The Two Memphis Bridges

ONE of the most advantageous opportunities for a study of the advancement in bridge design and construction during the last 24 years is afforded by a comparison between the new Harahan bridge just completed over the Mississippi river at Memphis, Tenn., and the Frisco bridge opened for traffic in 1892, which is located only 200 ft. down stream from the new bridge. Conditions are especially favorable for a comparison because the two bridges are of the same type and have almost exactly the same span lengths. Interest is added to such a comparison by the fact that Ralph Modjeski, consulting engineer, in charge of the new structure, was an assistant engineer on the construction of the older bridge. The weight of the last span of the new bridge was taken off the falsework on Friday, June 30, and the bridge was placed in service on July 15.

Aside from the attention merited by the details of the superstructure and substructure of a new bridge over the lower Mississippi, considerable interest attaches to the erection of the steel work because of the unusual flood conditions encountered. High water of unprecedented duration interfered materially with the progress of the work and resulted in a loss of considerable falsework and some structural material.

The new bridge, named after the late J. T. Harahan, was built by the Arkansas & Memphis Railway Bridge & Terminal Company, a corporation controlled jointly by the Chicago, Rock Island & Pacific, the St. Louis Southwestern and the St. Louis, Iron Mountain & Southern, all roads having lines terminating at Memphis. Until the new structure was opened for traffic, they used the old bridge owned by the St. Louis-San Francisco and were tenants of that road from the connections on the west side of the river to junctions with their own terminals in Memphis. In addition to the heavy traffic of the Frisco, between Birmingham and Kansas City, as well as that to St. Louis, the old bridge carried trains of the Rock Island between Memphis and Tucumcari, N. M., of the Iron Mountain from Memphis to Texarkana and St. Louis, and of the Cotton Belt to central Texas, the trains of the last named road running over Rock Island tracks as far as Brinkley, Ark.

General Description

As seen from the accompanying diagram the bridge consists of four spans of a cantilever arrangement having a total length of 2,201 ft. 10½ in., a simple 345-ft. deck span to the west, and west of that a steel viaduct, 2,363 ft. long. The bridge provides for two tracks 14 ft. center to center with a wide clearance of 8 ft. and a vertical clearance of 24 ft. above base of rail. Highway traffic is provided for by cantilever brackets outside of the trusses on either side, affording duplicate roadways, 14 ft. wide.

The tracks ascend from the east to pier 1 on a 1.1 per cent grade, continued on a level grade to pier 4 and then descend on a 1.126 per cent grade across the approach viaduct and an embankment three-quarters of a mile long at its western end. The highway deck is on the same grade as the tracks except on the viaduct, where it descends on a 3 per cent grade.

Commencing at the Tennessee end of the bridge there is an anchor arm of 186 ft. 3¾ in. from the anchorage to pier 1. The distance between piers 1 and 2 is 790 ft. 5¼ in., and is spanned by a suspended span of 417 ft. 9¾ in., carried by two cantilever arms of 186 ft. 3¾ in. each. Between piers 2 and 3 there is a fixed span of 621 ft., while the distance of 604 ft. 1½ in. between piers 3 and 4 is spanned by a semi-suspended span 417 ft. 9¾ in. long supported at its west end by pier 4 and at its east end by a cantilever arm 186 ft. 3¾ in. long. It will be noted that this arrangement permits of a number of duplications, i. e., two suspended spans of 417 ft. 9¾ in., and three cantilever arms of 186 ft. 3¾ in., this also being the length of the anchor arm at the east end of the bridge. The viaduct consists of a succession of 40 ft. towers with 80 ft. clear spans, the four lines of deck girders carrying the two railroad tracks being supported on cross girders at the tops of the bents. The highway decks are carried on brackets supported on the sides of the columns.

The total weight of the metal in the entire structure is about 21,400 tons, of which 14,700 tons is in the main cantilever structure, 1,400 tons in the deck span and 5,300 tons in the viaduct approach. One feature of note in this bridge is the use of an alloy steel (Mayari) to the extent of 8,900 tons. This material was used in all the main members of the trusses of the cantilever structure and in the pins and eye-bars of the deck span. A novel feature in this connection is the use of alloy steel for the bottom laterals of the main structure. The chemical requirements of this material are as follows:

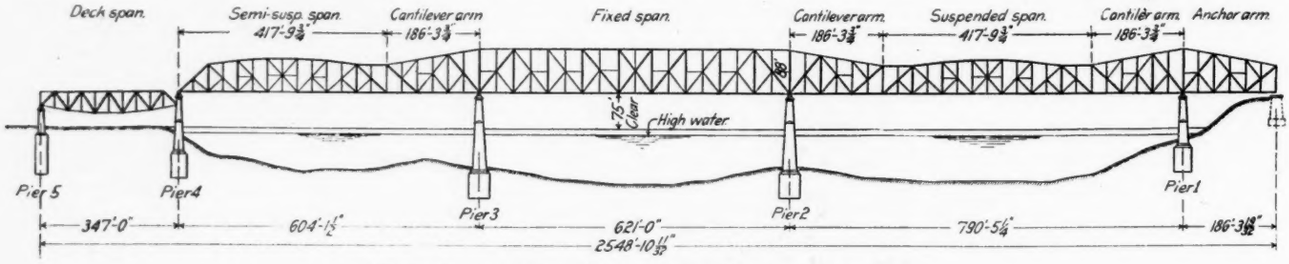
	Rivet steel	All other steel
Manganese	.60	.80
Phosphorus (acid steel)	.04	.06
Phosphorus (basic steel)	.03	.04
Sulphur	.04	.04
Silicon	.15	.15
Carbon	.30	.40

Aside from the limitations as shown above the alloy steel

was required to contain not less than 1.2 per cent of nickel.

The alloy steel was divided into three classes as to physical requirements depending upon the purpose for which it was to be used. The required ultimate strength varied from 70,000 to 110,000 lb., the elastic limit from 45,000 to 55,000 lb. and the minimum reduction of area from 40 per cent to 25 per cent in the order named.

The piers are of granite with concrete backing. They are all supported on pneumatic caisson foundations resting on a very hard blue clay. Piers 2 and 3, with the deepest foundations, were carried 192 ft. and 195 ft. respectively below the elevation of the copings. The 76 pedestals supporting the viaduct contain 55 cu. yd. of concrete each, and are each supported on 16 concrete piles 30 ft. long. A complete account of the construction of the substructure was given in an article by M. B. Case in the *Railway Age Gazette*, April 23, 1915, page 877.



Elevation of New Mississippi Bridge at Memphis

Falsework for the Fixed Span Swinging in the Flood

Design and Details

As the new bridge is only 200 ft. from the old one, the locations of the new piers were fixed by the position of the old ones, save that pier 4 was placed 17 ft. farther out in the river, thus shortening the span between piers 3 and 4 a sufficient amount to permit the duplication of the suspended spans previously mentioned. The anchor arm was made sufficiently short to insure an uplift on the anchorage under all conditions of loading. Otherwise the designers were permitted no latitude in the arrangement of the span lengths.

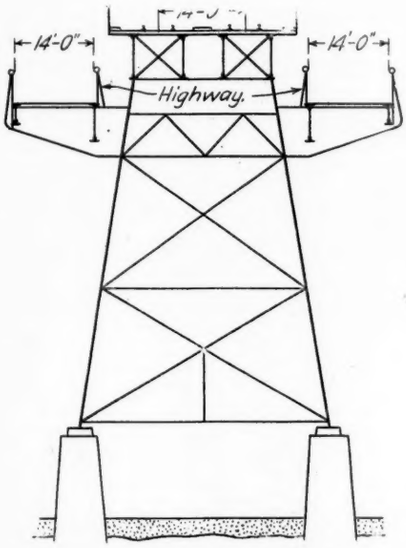
The maximum compression members are the bottom chords of the cantilever arms in the panels next to the piers and have sections of 319.3 sq. in., made up of four web plates 39 in. by 1 3-16 in. and eight angles 8 in. by 8 in. by 1⅛ in. The webs are vertical with heavy double angle lacing on the top and bottom and vertical diaphragms at frequent intervals. The maximum tension members are the top chords directly over the maximum compression members and consist of 10 eye-bars of which 6 are 16 in. by 2¼ in. and 4 are 16 in. by 2 3-16 in. As mentioned previously the bottom laterals are so heavy that alloy steel was found desirable. In the anchor arms these consist of a 24-in. by 13-16 in. plate and two angles 8 in. by 8 in. by ¾ in. maximum section.

The end of the anchor arm was given a vertical portal for the sake of appearance, but it is in reality a false portal because the two vertical members, being tension members under all conditions of loading, consist of eye-bars. To satisfy esthetics, they are enclosed in stiff box section members, cross-braced to give the appearance of heavy portal construction.

The uplift on the end of the anchor arm varies from 405,000 lb. to 6,892,000 lb. under the different conditions of loading. Consequently an anchorage of considerable size is necessary. As shown in one of the accompanying drawings this consists of a block or abutment of concrete 43 ft. high with a base 34 ft. by 80 ft., its weight of 10,900,000

lb. being sufficient to give a minimum bearing pressure of ¾ ton per sq. ft. under the condition of maximum uplift.

The uplift of the anchor arm is transmitted to the anchorage by means of two groups of eye-bars, each containing 6 bars 16 in. by 1¾ in., the load being transmitted to the bars by means of a structural steel grillage, consisting of 6 girders



Outline Section of West Approach

36 in. deep, assembled in a frame, which was equipped with columns to support it until it was imbedded in the concrete. To preclude the cracking of the concrete surrounding the eye-bars as they became extended under the anchorage stress, open wells were formed around the bars which were not filled with concrete until the uplift had assumed considerable proportions through the erection of the cantilever arm and the

Pier One and the Anchor Arm

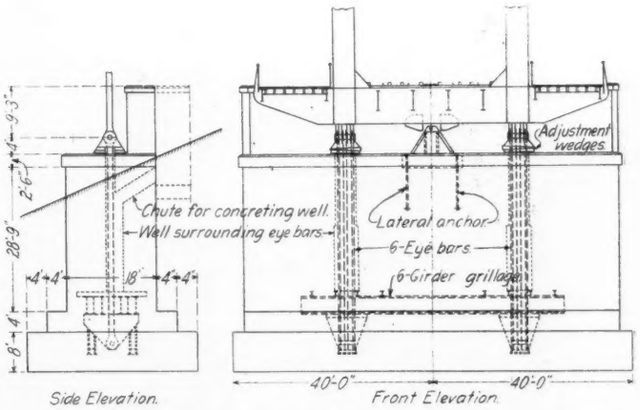
suspended span. The wedges shown in the drawing as forming a part of the shoes at the tops of these bars, were driven home at the same time to insure substantially uniform stress in the bars under all conditions.

On the bridge seat midway between the anchor shoes a bearing is provided to take the lateral forces. As the anchor arm must be left free to expand, this lateral bearing is designed to resist lateral movement only and does not interfere with either the longitudinal or vertical movement of the anchor arm.

Expansion Details

One of the accompanying photographs shows the connection of one end of the suspended span to the cantilever arm, the vertical hangers shown in the center of the picture serving as the supports for the suspended span. During the time that the cantilever arm and the suspended span were being erected, the top and bottom chords were continuous under the cantilever action. However, as soon as the suspended span was completed and supported from the cantilever arm by the hangers shown in the photograph, the panel of the top chord to the left of the hangers and the panel of the bottom chord to the right of the hangers became ineffective and carry no stress except as they are employed in preserving the continuity of the lateral systems. In fact these chords are broken, being provided with sliding joints to allow for the expansion and contraction of the trusses of both the suspended span and the cantilever arms.

This expansion amounts to 8 in. at each end of the suspended span and must be provided for also in the floor and lateral systems. As this is a greater movement than is allowable in any reasonable form of expansion pocket attached to



Details of the Anchorage, Reinforcing Bars Not Shown

the floor beams, the railway floor stringers at the expansion point are supported by a link arrangement as shown in one of the accompanying drawings. A similar arrangement is provided at the same point for the bottom lateral system.

An expansion joint is also provided in the rails at these points as shown in one of the accompanying photographs, and is an application of the principle of the rail lock of the sliding-tongue type used on draw bridges. In this case, however, the tongues do not move but are secured to the rails on one side of the joint. The tongues are made of heat-treated alloy steel.

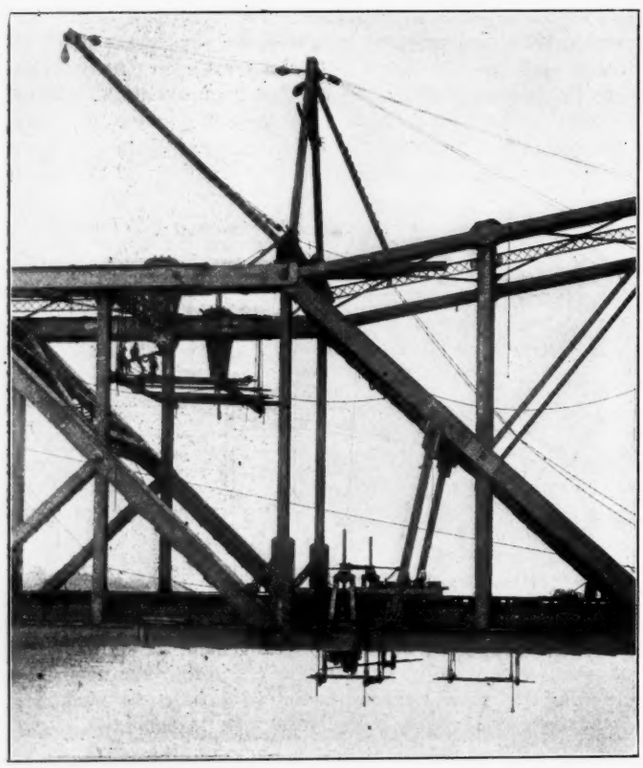
Falsework and Erection

Those portions of the bridge which were not erected by the cantilever method were carried on falsework consisting of towers of two bents each spaced 8 ft. center to center, at every main and sub-panel point. The upper portions of these bents consisted of two stories of frame bents having a total height of about 60 ft., each bent containing 12 posts at the main panel points and 10 posts at the sub-panel points. These frame bents were carried by pile bents of 26 and 22 piles respectively, which, owing to the great depth of water, required piles from 100 to 114 ft. in length, a total of 120,000 ft. of piles being used. The piles were Douglas fir, cut especially for this job. They were driven to about 30 ft. penetration with a marine driver having double leads 85 ft. high. The pile bents were cross-braced with timber from

the caps to the water line, but as this left a considerable height unbraced, cables were clamped to the two outside piles on one side and to three outside piles on the other side at a point that brought the clamps to the river bed when full penetration had been obtained. As each bent was completed, the other ends of these cables were brought over and made fast to the opposite end of the bent at the cap, thus forming a cross-bracing of cables.

Stringers for the highway deck were used temporarily as falsework stringers. The superstructure was supported on the falsework on sand boxes consisting of drums 5 ft. in diameter, made of heavy steel plates with plungers cut from tight cribbings of 12 in. by 12 in. timbers.

In accordance with a provision of the specifications, the rivets for all tension splices were set with a pressure riveting machine. In erecting the two halves of the suspended spans by the cantilever method the junction at the mid-point was facilitated by keeping the meeting halves of the trusses a material distance above the final position, with the distance between adjacent panel points in the top chord at a somewhat



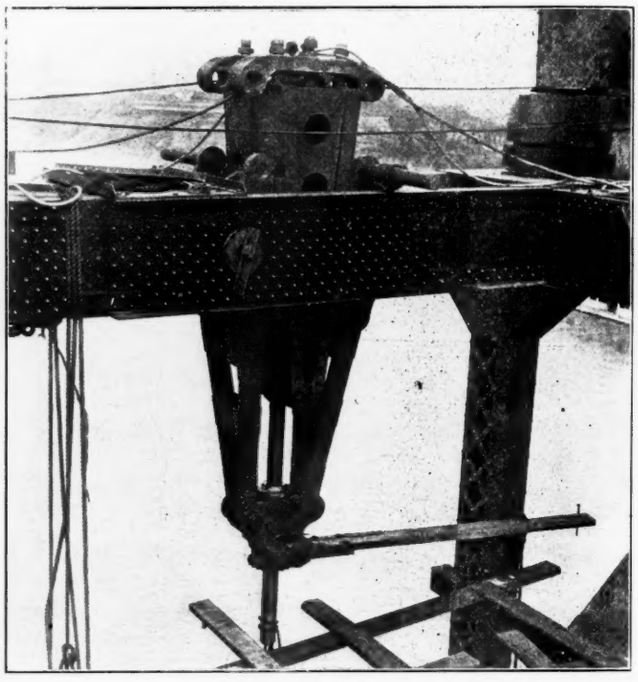
The Support for Suspended Span from Cantilever Arm

greater distance apart than the correct distance between these points, the reverse being the case between the panel points of the bottom chords. The complete assembling of the bottom chords across this panel was made possible by having slotted holes in the eye-bars of the center panel, while the splices in the top chords were left unriveted until the chords came together as the erection camber was taken out.

The camber of the suspended span and the length of the top and bottom chords were controlled during erection by wedges placed between pins in the broken sections of the top and bottom chords at each end of the suspended span as previously mentioned. These wedges, which weigh 50 tons each, are clearly shown in the photograph previously referred to. They were operated by a screw turned by a ratchet and a long lever. The pitch of the wedges is very flat and a delicate adjustment of the ends of the chord was possible. The wedges were used only for lowering the load and care was taken never to withdraw them further than was desired.

Erection Progress

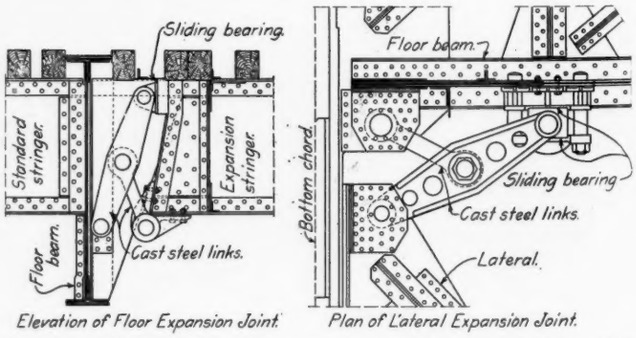
It was the intention to erect the anchor arm and all of the superstructure between piers 2 and 5 on falsework, the suspended span between piers 1 and 2, together with the two cantilever arms, to be erected by the cantilever method. In order to carry on any work on the pile driving or falsework construction, it was necessary that the stage of water in the



Wedge for Adjusting Chord Lengths

river be 20 ft. or less above standard low water level, while for security in the erection it was desirable that the water stage should not greatly exceed this level while work was in progress. It was also expected to time the work so that the erection of spans on falsework would take place late in the summer and in the fall when the river is ordinarily at a low stage.

Accordingly the erection of the anchor arms and the

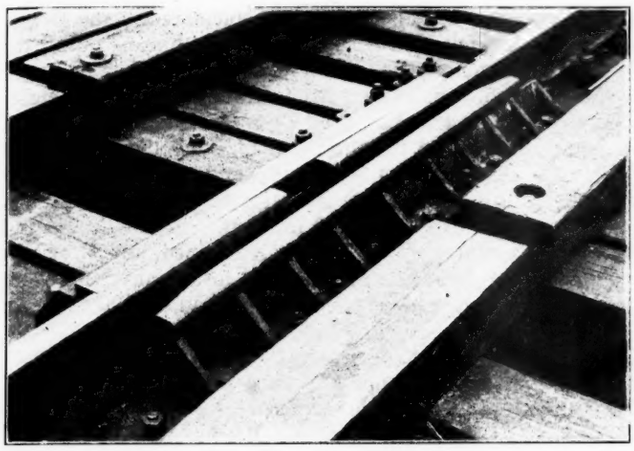


Details of Expansion Joints at the Ends of the Suspended Span

Arkansas viaduct, which was more or less independent of the water stage, was started in April, 1915, and carried to completion during the early summer. The deck span was started in August and finished in October and the east cantilever was finished October 1. Work on the falsework of the fixed span was started the latter part of May but progressed slowly on account of high water. On October 18 the water dropped below 20 ft. and work was rushed, the erection of the fixed span being started on October 15. The

erection of this span was forced at a maximum rate in spite of a rise in the river occurring between November 18 and December 3, and the last pin was driven on December 22.

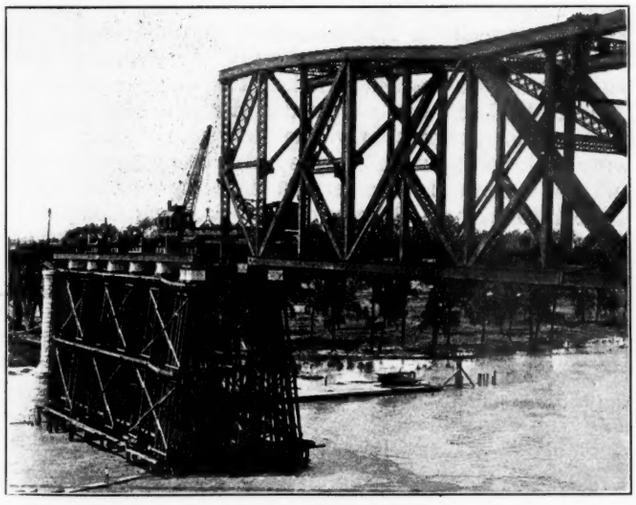
In the meantime the falsework between piers 3 and 4 had been completed and work had been commenced on the steel erection, but on December 23, the river rose to 28½ ft. and carried out all of the falsework between piers 3 and 4 except five tower bents adjacent to pier 3. In going out, this falsework carried with it the traveler, a mule derrick, the highway



Expansion Joint in the Rail Expansion

deck stringers which were being used in the falsework and four panels of the bottom chord and floor system.

The river continued to rise, going to 43.5 ft. on February 9, and for a time caused grave concern for the safety of the fixed span, the flood having come so quickly that there had not been time to swing this span entirely clear of the falsework after driving the last pin. On December 29 the first bent of this falsework gave way, followed by others until February 2, when all but two pile bents had been washed



Erection Progress on Semi-Suspended Span Showing Canvas Covers Over the Sand Boxes

away. However, the frame bents were not all lost, for by suspending a considerable portion of them from the steelwork it was possible to hold them until the water returned to a stage that made it possible to remove them. An accompanying photograph shows the conditions on February 2. A considerable number of the bents are seen swinging in the water.

On February 2, work was commenced on the creeper traveler to start the erection of the east cantilever from the fixed span, and the suspended span between piers 1 and 2 was completed on April 6. The west cantilever was started on April 27, it having been decided not to use the falsework between piers 3 and 4 except under the half of the suspended span adjacent to pier 4, as the rest of the span could be erected by cantilevering from pier 3. For this purpose the cantilever trusses were suitably reinforced. The falsework, therefore, consisted only of six towers, the one nearest the center of the span having four bents instead of two. The steel erection was started on this falsework on June 10 and the span was swung on June 30.

This bridge was designed and built under the direction of Ralph Modjeski, as consulting engineer in charge, with W. E. Angier as assistant chief engineer and M. B. Case as resident engineer. The substructure was built by the Union Bridge & Construction Company, Kansas City, Mo., and the superstructure was fabricated and erected by the Pennsylvania Steel Company, Philadelphia, Pa.

EIGHT-HOUR DAY COMMISSION APPOINTED

By H. F. Lane

WASHINGTON, D. C., October 10, 1916.

While politics played an important part in the passage of the Adamson eight-hour law, President Wilson has evidently not taken political considerations into account in appointing the commission which is to observe the operation and effects of the "eight-hour day" as provided for by the law. The President announced last week that the commission will be composed of Major General George W. Goethals, governor of the Panama Canal Zone and president of the Panama Railroad, who will act as chairman; Edgar E. Clark, of the Interstate Commerce Commission, and George Rublee, a member of the Federal Trade Commission. While none of these men have been active in politics, Mr. Goethals and Mr. Clark are reputed as Republicans and Mr. Rublee has been considered at various times as a Republican, later as a Progressive, and more recently as a Democrat, and the selection of such strong men for this commission seems to have been received with universal approbation.

General Goethals is a graduate of West Point Military Academy and his career has been that of an army officer in the engineering corps. He was chief engineer of the Panama Canal from 1907 until its completion in 1914, when he was appointed civil governor of the Canal Zone, and he has also been president of the Panama Railroad during that time. His prospective retirement from the canal work was announced on his recent return to the United States. Commissioner Clark was engaged in railway service from 1873 to 1889, when he was made Grand Senior Conductor of the Order of Railway Conductors. From 1890 to 1906 he was Grand Chief Conductor of the organization. In October, 1902, he was appointed by President Roosevelt a member of the commission to determine the issues involved in the strike of the anthracite coal operators. On August 28, 1906, he was appointed by President Roosevelt as a member of the Interstate Commerce Commission and he was reappointed by President Wilson on March 5, 1913. Mr. Rublee is a lawyer and was engaged in active practice in New York City for several years, and since March 5, 1916, has been serving a recess appointment as a member of the Federal Trade Commission.

Section 2 of the Adamson act provides for the appointment of this commission "which shall observe the operation and effects of the institution of the eight-hour standard work day, as above defined, and the facts and conditions affecting the relations between such common carriers and employees during the period of not less than six months nor more than nine months, in the discretion of the commission, and within 30 days thereafter such commission shall report its findings to the President and Congress." Members of the commission are to receive such compensation as may be fixed by the

President. The sum of $25,000, or so much thereof as may be necessary, is appropriated for the expenses of the commission.

While the law does not go into effect until January 1, it is understood that the President desires the members of the commission to give close study to the entire situation and that they will begin their investigation very soon. The provision for an investigation of the facts and conditions affecting the relations between the carriers and their employees gives an opportunity for conducting the inquiry on broad lines, and the fact that one of the members of the commission is a member of the Interstate Commerce Commission, who was also formerly the head of a railroad labor organization, insures that the commission will have at its command at the outset information as to all phases of the problem. Mr. Goethals has had experience as the chief executive of an important railroad and has also had practical experience with the operation of an eight-hour work day, as the employees of the Panama Canal have worked under an eight-hour limit.

The eight-hour day on the isthmus is a real eight-hour day and it is not the practice to require overtime work except in emergency, in which event employees paid by the hour receive time and one half for overtime. No extra compensation for overtime work is paid to persons whose compensation is fixed on a monthly or annual basis, except that locomotive engineers and conductors in the employ of the Panama Railroad, who have been working about nine hours a day in order to allow for the time necessary to take their trains to and from the construction work so that the men employed on construction work could work the full eight hours, have received an extra allowance for this time. On September 1, however, as noted in a recent issue of the *Railway Age Gazette*, General Goethals issued an order limiting the working day for train crews and switch engine crews to eight hours except in cases of emergency. At the same time the payment of overtime was discontinued.

The *Railway Age Gazette* has previously called attention to the wide difference between this kind of an eight-hour day and that provided for by the Adamson law, which merely provides for the payment of the present standard day's wage for eight hours' work, and for overtime in excess of eight hours at proportionate rates per hour, especially when this is superimposed on the present schedules which provide for the payment of a day's wage for 100 miles or less, or for 10 hours or less.

Senator Hughes of New Jersey a few days ago gave out a statement, after a conference with President Wilson, it was reported, saying that since Candidate Hughes has declared that he is in favor of a real eight-hour day this "means the disappearance of the eight-hour day controversy as an issue in the present campaign." Senator Hughes, it will be recalled, was the presiding officer of the Senate who signed the Adamson bill after the late Senator James P. Clarke, the president pro-tempore of the Senate, had declined to do so and had nominated Senator Hughes to take his place. A question arose as to whether Senator Hughes had signed the bill before or after the announcement of his appointment as presiding officer and it was stated at the time that he had signed it twice in order to make sure of it.

If he had read Candidate Hughes' statement twice he might not have made the prediction he did about the disappearance of the controversy as an issue in the campaign. At any rate, on the very next day Ex-President Taft joined in the attack on the law in a speech at Trenton, N. J., saying that "unwise subserviency to the demands of leaders of organized labor finds its crowning instance in Mr. Wilson's dealing with the threatened strike of the railway orders of conductors, engineers, trainmen and switchmen." "The issue of this controversy," he said. "is not whether the men were entitled to more pay than they received. They may deserve an increase in pay or a reduction in hours. The eight-hour day when practicable may be considered to be a great advantage. The glaring evil in the result is that by threatening public disaster a group of men has succeeded in compelling the abject surrender by the President and Congress of the principle of arbitration to a peremptory demand for a compliance with their wishes, without an investigation or a hearing of the most important issue." Mr. Taft again attacked the law at Indianapolis on October 6. John M. Parker, the Progressive presidential nominee, has also criticised both the law and the manner of its enactment.

Although President Wilson has continued to keep silent on the subject since his speech on September 23, the Democrats have not felt satisfied to let the Republicans do all the talking. Newton D. Baker, Secretary of War, has delivered a speech in which he made a strong argument for a real eight-hour work day, and Louis F. Post, Assistant Secretary of Labor, has delivered an address explaining the merits of a 12½-mile-an-hour speed basis and wondering why it should cost the railroads any more in wages to cover 100 miles in eight hours than to cover 100 miles in ten hours. He did not claim that the Adamson law contained any provision regulating the speed of trains nor did he say anything about the amount of freight which could be hauled 100 miles in eight hours.

The brotherhood leaders evidently have not been convinced that the issue has disappeared from the campaign. A. B. Garretson, president of the Order of Railroad Conductors, William G. Lee, president of the Brotherhood of Railroad Trainmen, Warren S. Stone, president of the Brotherhood of Locomotive Engineers, and Samuel Gompers, president of the American Federation of Labor, are scheduled as the principal speakers at a mass meeting to be held in Washington on Friday, October 13, under the auspices of the Wilson Eight-hour League. It is said that "a strong defense of President Wilson and Congress will be made."

Theodore Roosevelt recently raised a question as to how President Wilson could get his work done if the staff at the White House were put on an eight-hour day. We do not understand that the question has come quite so close to home as yet, but the subject of the hours of labor has become an issue in some of the executive departments. Thomas F. Flaherty, secretary of the National Federation of Post Office Clerks, has written a letter to President Wilson asking for shorter hours for post office clerks. He says that Postmaster General Burleson has disregarded the law passed by the Sixty-second Congress providing that postal clerks should work no longer than eight hours a day except in emergency, and that in many of the larger post offices the force is required to work 10, 11 and 12 hours a day. President Gompers, of the American Federation of Labor also wrote to President Wilson some weeks ago, urging that the department offices be closed on Saturday afternoon all the year round instead of only during the summer. Copies of this letter were sent to the cabinet officers for their remarks. Secretary Redfield and, it is understood, some of the others, have recommended to the President the issuance of an executive order in accordance with this request. The clerks in the government offices now work seven hours a day.

The coal miners of the country are planning to go the railway brotherhoods one better, according to an announcement by John P. White, president of the United Mine Workers of America, who said in an address at Bellaire, Ohio, on October 7, that demands for a seven-hour work day are to be made by the coal miners at coming wage conferences.

H. N. Pope, president of the Association of Farmers' Union Presidents, has issued a statement asking the farmers to urge their congressmen to repeal the Adamson law at the next session of Congress. "If giving to trainmen is a virtue," he asked, "is not taking from the farmer a crime? Has Congress the power to increase the expenses of industry many millions of dollars without someone paying the bill?"

Representative Kitchin, floor leader of the House, has been

quoted as saying that Congress will take up the consideration of the law soon after the next session convenes, unless an extra session is called, and that the House will oppose any suggestion from the railroads that freight rates be increased to offset the expense.

* * *

Aerial Mail Service.

In case a fine of $1,000 a day is not sufficient to induce the railroads of the country to carry mails at the space basis rates tentatively prescribed by Congress which the Postmaster General is planning to impose on all of the railroads on November 1, the department apparently has another card up its sleeve. It is announced that Second Assistant Postmaster General Praeger has issued an order authorizing Victor Carlstrom, aviator, to inaugurate an experimental mail service by aeroplane between Chicago and New York between October 7 and November 1, giving the aviator the option to make the trip on any day that he may deem favorable for the experiment. Carlstrom is said to have represented to the Post Office department that he could make the trip in 10 hours. Joint committees of the Post Office Department and of the National Advisory Committee for Aeronautics are to study the question of establishing aeroplane mail service.

Supreme Court.

The October term of the United States Supreme Court was begun on Monday, October 9. The court now has about 700 cases on its docket. No opinions were given on the first day, which was devoted to the hearing of motions. The first decisions are expected next Monday. The first arguments were heard by the court on Tuesday and among the cases heard were the suits of the government under the anti-trust law against the Reading and Lehigh Valley companies for alleged monopolization of the anthracite coal industry. A number of very important railway cases are before the court either for decision or for argument, among them being the suit of a number of railways against the Post Office department, involving the basis for computing railway mail pay according to the weight as ascertained by quadrennial weighings. Other cases include that of the Manufacturers' Railway of St. Louis against the decision of the Interstate Commerce Commission prescribing the allowance it may receive for switching service, the case involving Pacific Coast terminal rates, in which the district court of Northern California enjoined the order of the Interstate Commerce Commission denying terminal rates to Sacramento, Stockton, San Jose, Santa Clara, Calif., and other inland points.

* * *

It seems to be taken for granted that there will be an appeal to the United States Supreme Court from the decision of Justice Stafford, of the Supreme Court of the District of Columbia ordering Milton H. Smith, president of the Louisville & Nashville, to answer questions put to him by Chief Counsel Folk of the Interstate Commerce Commission, regarding expenditures of the road for political purposes. The decision was briefly noted in last week's issue. he questions which Mr. Smith refused to answer were asked in a hearing in the consolidated proceedings growing out of a resolution introduced in the Senate by former Senator Luke Lea of Tennessee, and also a case in which he was a complainant. In its petition for an order the commission selected 10 questions, which asked whether funds of the road had been expended for campaign purposes, whether such expenditures had been charged to operating expenses, whether the company had expended funds through an advertising agency in a campaign against rate reductions, and the purpose of certain vouchers regarding which information was refused to the commission's examiners.

While the court declined to grant a motion of the commission to strike out of the defendant's answer a charge that the investigation was instigated as a part of a political campaign against the road by former Senator Lea, it stated that such matters would be treated as immaterial in deciding the case.

The court remarks that the petition does not specify the use expected to be made of the information sought, and then discusses at length the question as to whether it is entitled to the information merely for the purpose of keeping informed regarding the business of the carriers, under a general provision of the act, or whether the case comes within the scope of the amendment to Section 13, of June 18, 1910, giving the commission authority to institute an inquiry "as to any matter or thing concerning which any question may arise under any of the provisions of this act." In giving its decision the court said:

"It is difficult to avoid the conclusion that if the amendment of 1910 is to be given any force whatever it must be considered as having empowered the commission to proceed by way of investigation and the examination of witnesses with respect to such matters as these, not because they involve the political activities of the carrier, but because they involve the expenditures of its funds and so affect the question of the reasonableness of its rates and also involve its method of accounting, under which by means of a false system, it would be possible to keep the commission in ignorance of important elements in the problem with which it has to deal. The conclusion of the court is that when a case is presented from which it clearly appears that the information sought may well be needed by the commission to enable it to enforce the existing provisions of the act in respect to the duties which the act has imposed upon carriers in the transaction of interstate commerce and not merely to inform the mind of the commission to enable it to recommend future legislation, a question does arise under the provisions of the act, entitling the commission to institute an inquiry and examine witnesses and consequently, upon the refusal of the witness to answer, to invoke the aid of the court. The distinction may perhaps still be drawn, as it was in the Harriman case, between the enforcement of the existing provisions of the act which impose duties upon the carrier in respect to its methods of conducting interstate commerce, and those other provisions which are intended to secure to the commission information for the purpose of enabling it to recommend additional legislation; for as to the one matter Congress has already determined how the carrier shall operate in the conduct of its business and has imposed upon the commission the duty of seeing that the law is complied with by the carrier, while as to the other matter the commission is merely expected to inform itself for the purpose of proposing further legislation. It is not necessary in order to sustain the present petition to hold that as to mere matters of information the Commission is authorized to proceed by investigation and examination of witnesses for the case now in hand appears to present a situation within the first division."

Transportation Problems in São Paulo, Brazil.—The president of São Paulo in his recent message to the legislature recommended the leasing by the state government of the principal railways of the state. This matter has been under discussion for several years, and the president regards state control as urgent, in order that the present high freight rates may be lowered. It is stated that foreign investors are inclined to acquire railways which are already in operation, rather than to construct new roads which would aid in the development of the country. In 1915 only 88 miles of railway was constructed, making a total of 3,893 miles of railway in the state. Three-fourths of the whole, or 2,700 miles of railway, is owned by private corporations, 972 miles is owned by the state, and 220 miles by the federal government.

Car Inspectors' and Car Foremen's Convention

Discussion of Rules of Interchange; Interesting Papers on Car Inspection and Car Department Problems

THE eighteenth annual convention of the Chief Interchange Car Inspectors' and Car Foremen's Association was held at the Hotel Severin, Indianapolis, Ind., October 3 to 5, inclusive, A. Kipp, general car inspector, New York, Ontario & Western, presiding. The convention was opened with prayer by Rev. Frank S. Wicks and the association was welcomed to the city by City Corporation Counsel William A. Pickins. During the convention the association was addressed by F. W. Brazier, superintendent of rolling stock, New York Central (East); W. O. Thompson, superintendent of rolling stock, New York Central (West); A. La Mar, master mechanic, Pennsylvania Lines West, and Roy V. Wright, managing editor, *Railway Age Gazette.*

President's Address

We are all familiar with the equipment in use today—some of it has been improved to meet the more severe service conditions brought about by the use of heavier power, but there are still some cars which have not been so improved, and the inspectors must be careful in their inspection and use good judgment in deciding whether or not these cars are safe to run in the long trains of today. A greater uniformity in construction of our freight cars is needed to alleviate some of the serious difficulties encountered in the transportation problem of the present time. This subject deserves considerable thought, and there are none better able to realize what benefits are to be derived from this than the members of this association.

D. R. MacBain, in his presidential address to the Master Car Builders Association, recommended that that association consider the advisability of making the owners of cars assume all responsibility for the damage and repairs to them. This is an excellent idea, but it involves again the question of equipment of uniform construction, for otherwise it would be necessary for the railroads to carry a larger stock of material in order to make prompt repairs.

The establishment of the office of chief joint car inspector has done a great deal toward the improvements in the interchange of cars, and the car inspector himself is a vital factor in the entire plan. Much has been said and written as to the requirements of a good car inspector and much more could be added. In brief, he should be a practical man with a thorough knowledge of car construction, the M. C. B. Rules and their proper interpretations, the M. C. B. loading rules, the safety appliance laws and be a man of good judgment and able to apply the knowledge he has obtained in the performance of his work. He should have close relationship with the general inspectors in order that he may make more judicious inspections and better understand the M. C. B. Rules. The M. C. B. Rules are complicated and require considerable thought. It might be a good plan to have the references and exceptions follow each particular rule, also to incorporate the M. C. B. Rules of Interchange, the loading rules and the safety appliance laws all in one book for the convenience of the inspector.

In regard to the work of the association itself we have this year broadened the scope of the membership to include car inspectors, M. C. B. bill clerks or anyone actively engaged in the work of the car department. In addition to this the association will consider, for the first time, other subjects not relating particularly to the M. C. B. Rules. This brings the association to the task of studying the car problem in the larger sense and will make the association of greater service to the roads of the country.

Address by Mr. Brazier

The young men in the mechanical department of our railways have no better opportunities than in the car department. More than half again as much money is spent by the car department as by the locomotive department and there is just as much demand for bright men to handle this expenditure. The work of the car men is the most important on the railroad. These men have more to do with the safety of operation, and of freight and passengers than any other class of railway men. It is necessary to work hard and continuously to obtain closer inspection and better maintenance. The car department men on the firing line can do a great deal to improve car design by calling the mechanical engineer's attention to the inherent defects as they are found in the equipment. There is much need of strengthening much of the equipment in service on the railroads today. It is many times difficult to collect for damaged equipment which resulted by its being of insufficient strength as the owners claim that it was subjected to unfair usage. A road may protect itself from this by refusing to accept cars of improper construction and insufficient strength.

The work of this association is very commendable. By getting together each year in this manner a clearer understanding of the M. C. B. rules is obtained.

Address by Mr. Thompson

The car end of railroading has improved wonderfully in the past few years. The railways are waking up to learn the needs of the car department. There is still much to be done, and for the young man there is no greater opportunity than in this department. With the large expenditures and the way they are made the car men can save a great deal more money for their railroads than any corresponding man in the locomotive department. An association such as this one is performing one of the most important works in the country, by thoroughly discussing and coming to a common understanding of the M. C. B. Rules of Interchange. It is well worth the expense to the railway companies to have their men attend these conventions for the benefits they receive from the clearer understanding of the rules.

Address by Mr. Wright

There are tremendous possibilities in the car department. It is responsible for large expenditures and needs capable men to see that the expenditures are made to the best advantage. While the men in the car department have not always got their just deserts their relative importance is becoming more apparent each year. They have a real work to perform, and, as suggested by Mr. Brazier and Mr. Thompson, young men should be encouraged to enter this great field. It might be said that there are greater opportunities in the car department than in the locomotive department, for the locomotive has developed at a much more rapid rate than the cars used in train service today. The labor question and organization in the car department demand the most careful study. Team work and esprit-de-corps is absolutely necessary and of prime importance. While many roads are having extreme difficulty in holding their laborers and mechanics in the car department, there is one point which has held its organization to almost 100 per cent efficiency without much increase in wages because of the ability of the foreman in charge.

We sometimes hear criticisms of the mechanical engineers or designers regarding the poor cars in service. These men are not wholly to blame. They are dependent on the men on the firing lines for information regarding the performance

of and the defects found in the equipment. The car men as a general rule have not been aggressive enough. They should keep after the designer and speak loud enough to have their contentions heard until the defects in car construction and design have been corrected. The future of the car department is dependent on the development of the young men. They should be picked carefully and be given specific training for the work that is to come. By broadening out the scope of the association's work, such as has been done this year, you give the railroads what they need; that is, more detailed information from men on the firing line as to the weaknesses of the car department and how they may be corrected.

Discussion of the Interchange Rules

The M. C. B. Rules of Interchange were read by paragraphs, and any questions raised by the members were thoroughly discussed and an agreement reached as to the intended meaning of the rule in question. The following is an abstract of the discussion on the more important questions:

Rule 2 (*b*).—"Cars loaded with explosives must be handled in accordance with the regulations of the Interstate Commerce Commission.

"Cars containing inflammable liquid which is leaking must be repaired or transferred without any unnecessary movement or at nearest available point."

A question was raised as to whether or not the receiving line could be made to accept and repair a leaking tank car received from the delivering line in a leaky condition. Some contended that it was impossible to do so, although the consensus of opinion was to the effect that whichever road had the nearest available repair point should receive the car and make the repairs; and, further, in case the delivering road was responsible and the receiving road made the repairs the delivering road was to be held responsible for the expense.

Rule 2 (*j*).—"When load is not transferred, the car, if foreign, may be returned, when empty, to the delivering line, properly side-carded on both sides of the car with a 'bad order, return when empty card,' showing the defects for which the car is returned, in which case it must be accepted."

While it was generally believed that this rule means that the car should be returned immediately to the interchange point, it was shown that the practices regarding the strict compliance with this meaning varied. For instance, at Chicago such a car will not be accepted if it is not returned within 60 days, while at Cleveland and Cincinnati no time limit is set and the car is received, provided it comes back in the same condition. At St. Louis such cars will be received, even though they come back with more defects than were originally carded, the new defects being carded against the handling line, with the exception, however, that the condition of the car is such that it should be handled under Rule 120.

Rule 3 (*c*) (*third paragraph*).—"All brake beams referred to shall have the letters 'M. C. B.' and proper number stamped or cast on strut, as required by the specifications."

Strong objections were made to this location of the identification marks of the brake beams as it is impossible for an inspector to properly ascertain the size of the beam without placing himself in a hazardous position. It was the unanimous vote of the association to petition the Master Car Builders' Association for immediate action regarding this condition. It was believed that the size of the beam could just as well be shown on the brakehead.

Rule 4 *Paragraph* 2.—"Defect cards shall not be required for any damage that is so slight that no repairs are necessary."

The question as to just how much damage must be caused to require defect cards seems to be an almost indeterminate one. Mr. Schultz of the Chicago Interchange Bureau stated that 75 per cent of the defect cards are such that they should not be necessary for immediate repairs. Some suggested putting a limit to the time of payment on the defect card of something like 60 days. Mr. Harvey of the C. B. & Q. stated that from an investigation made it was found that 51 per cent of the cards issued against that road were not billed on in six months' time, and he expressed the hope that there would come a time when no defect cards were used at all. In order to come to a common understanding as to just what this second paragraph of Rule 4 meant, a committee of car inspectors and car foremen was appointed and its findings are as follows:

"Your committee appointed to take up and report specially on the second clause of Rule 4, in so far as the use of defect cards are concerned for damages too slight to warrant repairs, submits the following:

"First—This rule was incorporated by the Master Car Builders' Association to overcome the abuse of defect cards in interchange and has been in the rules for a number of years, and your committee at the outset feels that we should fully respect and live up to and follow the strict intent of this rule.

"Second—The rule provides that the chief joint interchange inspector is the judge for carrying out the intent of this rule and it is felt by this committee that in many cases it is merely nominal and not positive and that arrangements could be made so that the intent and purpose of this rule could be absolutely covered by the chief joint interchange inspector, and any local changes desired by roads must be handled through the chief joint interchange inspector and his decision be final in all cases.

"Third—In submitting this recommendation, it is given with the full intent and understanding that all members of this association will use their best efforts to correct this evil, as we feel it can only be corrected by the hearty co-operation of the different interchange points, which is submitted with the understanding that it is acceptable."

Unfair Usage.—Under this head the question was raised as to whether or not damage to permanent crossties extending across the top of gondola cars, occasioned by unloading the cars, was an owner's defect. It was pointed out that these cars were built for a special purpose and that if these crossties were damaged while being used for other purposes it should be an owner's responsibility. In cases of this kind it would be necessary for the owners to stencil on the side of these cars that they were to be used only in the specific service for which they were designed.

Rule 43.—Regardless of how trap doors in all-steel or steel underframe cars were lost it was believed that they were chargeable to the owner unless such loss was evident from unfair usage, wreck, derailment, etc.

Rule 60.—It was believed desirable to make the method of stenciling air brake apparatus, as indicated in the last paragraph of this rule, standard instead of optional as trouble has been experienced by some claiming incorrect stenciling. F. C. Schultz stated that some cars have been carded for not having dust collectors, which were never used on the cars, simply because the stenciling contained the words "dust collectors."

Rule 102, *last paragraph.*—"In computing charges for bolts, nuts and forgings, if fractional weight of each entry on billing repair card is less than one-half pound, it must be dropped; if one-half pound or more, charge the entire pound."

There was some dispute as to whether the M. C. B. Association means each individual item or the sum total and it was voted to ask that association for an interpretation.

Rule 120.—It was believed that the M. C. B. Association could give the roads great assistance in disposing of the cars governed by this rule if it was made compulsory for the roads to give the proper authority quickly for the handling of the cars.

FREIGHT CAR MAINTENANCE

I. J. Justus (N. Y. C.).—The importance of the subject of freight car maintenance cannot be overestimated, as the amount annually spent for this purpose staggers the imagination. The all-important matter is how to spend this vast sum of money so that the best possible results will be obtained. Shall it all be spent in maintaining the present light capacity wooden cars, repairing them to their original standard when broken or worn out, or shall a part of it be spent in "betterments" strengthening this type of car by applying steel underframes, steel or strengthened ends, up-to-date draft rigging, steel carlines, metal roofs and doors that are not liable to drop off and will prevent water getting into the car and damaging the lading. Much depends on the decision of these questions. It has been the experience of a well-known railroad that the wooden car, especially the box car, in a generally good condition, should be repaired with a steel underframe, having an improved draft-rigging and strengthened ends, rather than to be repaired to its original standard.

These are the three courses open to the car owner; if sufficient money is available, the old cars may be torn down and replaced with large capacity steel or steel underframe cars. If money is not so abundant, which is the usual condition, the wooden car, particularly the box car, of not less than 60,000 lb. capacity, can be rebuilt with a steel underframe, improved draft-rigging, strengthened ends, etc.; or if the size of the box car is large enough, it could have new trucks of larger capacity, and the carrying capacity of the car thereby increased. The point is often brought up by those in charge of repairs of freight equipment on the smaller roads having light locomotives, that the present wooden car is all right and that they can handle their business satisfactorily with it in its present condition without spending large sums of money to strengthen it. This point might be well taken if their cars always remained on their own road, hauled in short trains by small locomotives, but this is not the case. These cars go all over the country and are subjected to the same conditions of service as the modern steel or steel underframe cars, hauled in the same trains and subjected to the same hump yard switching, with the result that the center sills are cracked or split, the draft arms or bolts broken, allowing the draft arms or the coupler to be pulled out.

Particular attention should be called to the importance of maintaining the doors of box cars in good condition. It is not an uncommon thing to see doors having no metal stiffeners at the bottom, with the corners torn out or rotted away at the point where they should engage the door guides, swinging in and out as the train moves along, with nothing to hold them in place but the door hasp, and liable at any minute to drop to the ground. All doors, when rebuilt, should have a substantial metal bottom stiffener and not less than four deep door guides, securely fastened to the car and a good strong door hasp fastened to the door with at least four bolts. The hasps should, by all means, pass through one of the horizontal battens, all of which should extend the full width of the door. The door should have a good track, substantial hangers, and interlocking spark-strips, which will hold the door securely in place and prevent water leaking into the car around the door. The practice of "repairing in kind" cars having wooden door stops is another bad thing, as the hasp fastener attached to the wooden door stop with two bolts will not stand modern service conditions, and the wooden door stop is soon split and the hasp fastener torn out. I am sorry to be obliged to say that I have seen new cars built this year with wooden door stops, and with hasp holders attached to the door with only one bolt. The repairs to damaged ends are often made with no regard to strength. If the top is pushed out it is crowded back into position and held in place only by a few nails and a new fascia board; if the end sill or an end post is broken, a new one is applied and the end posts fastened to the end sills only with nails and some new end sheathing boards applied. This end, after repairs are made, looks all right, but has not the strength to withstand the shocks that it will be subjected to.

Just as much importance should be attached to the quality of the work turned out as to the quantity. It has been found from a thirty-day record kept on 6,000 miles of railroad that steel and steel underframe cars are in for repairs to draft sills and draft attachments not oftener than once a year and the modern cars considerably less than that, while wooden cars, with wood draft arms, are in for the same class of repairs about two and one-half times a year. It has been the experience of at least one road that wooden cars equipped with properly designed repair steel underframes will hold their own in service with modern steel and steel underframe equipment, and that there is a marked reduction in repair bills when these cars are on foreign roads especially if they also have steel ends. The present practice of replacing arch bar trucks with cast steel side frames is a move in the right direction, as it does away with some bolts that have always given us much trouble to maintain. Standardization of the designs of parts is one reason for the great reduction in maintenance cost.

We should at all times report to the proper officers to have defective designs improved to obtain easier, better and cheaper maintenance. If there is some weak point in a certain series of cars, which is constantly failing, we have not done our full duty by simply repairing these cars. We should earnestly devote ourselves to the task of overcoming this inherent defect in existing cars, in design or material, by such changes as will strengthen the part that has given the trouble and thus put a stop to this unending repairing of this particular defect. In the designing of new equipment the men that are in actual charge of the maintenance should be consulted and work with the designers of the equipment, not only at the time when the cars are designed, but after the cars are in service following them up and reporting from time to time to the mechanical department any defects that may develop, with the idea of having the design changed in the next lot of cars built. A great improvement in the quality of repairs made to freight cars would be apparent in a very short time, if the men in charge were at all times near the work, giving it their close personal supervision instead of being obliged to spend so much of their time attending to office duties which should be handled by others.

CO-OPERATION BETWEEN YARD AND CAR REPAIR FORCES

R. H. Dyer (N. & W.):—Co-operation between the yard and car repair forces is absolutely essential for the promotion of good railroad business as well as necessary for the economical handling of railroad terminal yards. Freight will be delayed and cars will take longer to repair when the two forces fail to work in harmony with each other. Often cars are shifted on incline and gravity tracks at unnecessarily high speeds which result in damaged equipment for which the car repair forces are often held accountable, being called upon to explain why they have so many bad order cars. In the days of the link and pin coupler the yard crews instinctively regulated the movement of the cars, making the couplings at moderate speeds, not solely for their convenience but for their personal safety as well. Unfortunately, with the advent of the automatic coupler the necessity for this care in making couplings has been eliminated and there seems to be an apparent lack of interest in the preservation of the equipment. It matters not from the shop man's point of view whether the cars are destroyed by jerking or buffing, although the latter is the more serious, but it does seem that if the yard forces could be made to realize how costly rough handling is, they would be more careful how they handled the equipment.

In the interest of co-operation with the yard forces, the car inspectors should decide as quickly as possible after a train has arrived at a terminal, upon those loaded cars which will, due to their condition, require transfer. This will per-

mit the yard forces to move those cars direct to the transfer tracks and hasten the transfer of the load. This also applies to the cars that must be set out for repairs whether loaded or empty. The car foremen, in selecting equipment for special lading, should seek to cause the yard forces as little switching as possible. On the other hand the yardmasters can be of great assistance to the repair forces by advising them as soon as possible as to the equipment that will be required for this special lading so that it may be properly prepared, if none is available, with the least possible delay to the shipment. In the larger yards where shop cars are classified on special tracks provided for the purpose, much has been accomplished by the inspectors indicating those cars to receive light and heavy repairs by attaching small red and white cards to the side of the cars. This enables the switching crew to tell at a glance, and at some distance, on what shop tracks the cars are to be located, which greatly assists the repair forces and eliminates extra switching.

When cars are once damaged, particularly the draft gear, the end sill or the center sills, additional handling often means that the damage to the cars will be greatly augmented and that the final cost of the repairs will be much greater than had the repairs been made without further shifting of the cars. For this reason many car repair men advocate locating the repair point as near to the point at which the bad order cars assemble as possible. In this regard attention should be called to the importance of the yard forces respecting the blue flag designating that the cars are undergoing repairs and that they are not to be moved. Likewise the repair forces must remember that the repairs should be made as quickly as possible and never allow the flag to hold up the cars longer than is absolutely necessary for their own personal protection.

The car repair forces occupy an important place in the transportation problem in making it possible to move the equipment with safety to train operation and to the patrons of the road. A good yardmaster will consider the repair forces as assistants to him in expediting traffic and will offer them every means for making quick repairs and the returning of the equipment to service promptly. He will recognize that while the car repair work may be a necessary evil it is an important part of railroading and that any delay to the car department rapidly doing its work will be expensive in that the cost of the work will be greater, cars will be delayed, revenue lost and last, but not least, the shippers may be caused considerable embarrassment.

CAR DEPARTMENT ORGANIZATION AND EFFICIENCY

C. R. Dobson (C. R. I. & P.):—There is no department on a railroad which offers as wide a field for an advance in efficiency as the car department. The shortage of freight car equipment has been very acute in some localities during the past 12 months with no relief in sight. Just think of the cumulative saving in the many directions if a railroad had *all* good car equipment in first-class serviceable condition. Let us analyze the results if such were the case. There would be a considerable reduction in loss and damage claims, reduction in switching cost, and an unusual reduction in amounts of repair bills rendered by foreign lines. It would lessen the Per Diem cost of foreign cars, which would not then be required, and enable such a railroad to secure the cream of the business in highly competitive territory, on account of being able to furnish good equipment. L. F. Loree, president of the Delaware & Hudson, is quoted as being of the opinion that a freight car is at the money-making task of moving goods one-tenth of the time and is idle or imposing upon its owner for switching, storage, repairs, etc., the other nine-tenths of the time. If this is so the mechanical department should be placed in a position to expedite repairs to equipment.

There are three essential factors in a strong car department organization; thorough co-operation in the department; efficiency and economy. Maximum output depends upon a strong organization. With the increase in the cost of both labor and material it is necessary for the car department head to increase the efficiency of his organization, by contributing to or adding to the capacity or skill of each individual department foreman and employee. Co-operation promotes that feeling of good will and reciprocity which results in increased efficiency. No individual in any department begins, or carries to a successful conclusion, all the work in his department. Therefore, it will be readily seen why it is so necessary that harmony and co-operation should prevail at all times.

There are two distinct classes of employees in the car department, the producer and the non-producer, each class being distinct and actually necessary. The producers are the various classes of employees who actually effect repairs to or rebuild car equipment. The non-producers are many and are composed of foremen, clerks, shop inspectors, tool-room men, supply men, laborers and others; this is equally true in either piece work or day work shops and should not be overlooked. It would be well for every general car foreman to check up his forces and ascertain if there are the correct number of each class of employees in his department to constitute a well-balanced force, and thus determine if a maximum output is being obtained on an economical basis.

Freight cars should, when possible, be handled and repaired as near the base of supplies as possible. Freight car material should never be maintained in stock at any great distance from the repair tracks and shops. If the light repair yard is situated some distance from the shop or heavy repair tracks a sufficient amount of ready material should be carried at the light repair tracks. Supply men should be employed to deliver all lumber from the mill or lumber yard, metal roofs, couplers, brake beams, brake connections; in fact all material possible. The results obtained from this practice will be surprising. The saving in cost is also an inviting feature on account of the difference in the rate of pay, etc. This of course applies more forcefully to shops paid on an hourly basis; however, it will also apply to piece work shops.

Every well organized freight car shop and coach shop should maintain a tool room with a man in charge, whose duty it will be to keep all tools in their proper places, in good order and well lubricated where lubrication is necessary. If the entire time of the man in the tool room is not required in caring for the tools, he can reclaim and sort nuts, washers, nails, cotters and lag screws, picked up in the shop and on repair tracks by the labor force and deliver them back into the store stock.

There are also some very interesting as well as profitable results obtained by specializing the men in some lines of car work; for instance, some men are experts in applying roofs, others are more adept in applying sheathing, while still others will be found at their best on rougher work on flat or gondola cars. The appropriation allotted to the car department on most roads usually covers the cost of material used as well as labor, therefore all usable second hand material which accumulates around the larger repair yards and scrap bins should be reclaimed and used on system cars. Every dollar saved can be very profitably applied in repairing bad order cars.

The master car builder or the general foreman of the car department must of necessity be a strong man, of good clear judgment, alert and capable of taking the initiative in all of the many perplexing emergencies which arise in his department, and he must be a good judge of human nature to enable him to perfect an organization which will show results for the money expended. There was a time when we were struggling along on very meager appropriations, and, in order to get by, we resorted to the practice of effecting only such repairs as were necessary to move and keep cars in service. The results have been disastrous, and it seems to be very difficult to get the car department out of this rut. This prac-

tice of "a lick and a promise" resulted in loaded cars being cut out and sent to every repair track or shop along the line of a long haul. I wish to emphasize at this time the necessity of effecting permanent repairs to equipment requiring both light and heavy repairs and not to discriminate between system or foreign cars; treat them all exactly the same, having in mind at all times that both foreign and system cars should be maintained in good serviceable condition. Eternal vigilance, industry and last, but not least, "honesty" are the price of success.

CAR DEPARTMENT APPRENTICES*

B. F. Patram (So. Ry.):—The question of apprenticeship in either car building or car repairing today is one that requires a great deal more thought, study and consideration than it has ever received since its inception. With the proper training along mechanical lines very much better mechanics for the passenger department can be made out of bright, energetic boys than by any other method known to me. However, there are a great many things other than strictly mechanical ideas that should be instilled into the boy's mind during the first and second years of his apprenticeship. The main points that should be carefully considered are to train the boy to be watchful, alert, quick to respond and neat. The first impression made on the apprentice's mind is very important, for his mind is young and receptive and when the boy is made to see and understand he does not soon forget.

An apprentice in the passenger car department should have at least passed through the sixth grammar grade, or its equivalent in schooling and his fitness or degree of education should be determined by an examination prepared by the head of the car department. After passing this examination, and it has been decided that the boy will start on his apprenticeship, he should be put to work, and should carry out the following schedule:

Six months building and repairing passenger car trucks;
Six months building and repairing platforms;
Six months in the mill, laying off work only;
Six months building and repairing engine cabs and pilots;
Twelve months working on the outside of passenger car bodies;
Twelve months working on the inside of passenger car bodies.

If this schedule is thoroughly carried out it should qualify the boy for any position in the car department. If, at the end of the first six months, the boy does not show the proper aptitude to make an efficient car builder and repairer he should be transferred to some other branch of the railroad business to which it is thought he is better suited. During the four years' course the importance of a technical education should be impressed upon the mind of the apprentice and everything possible should be done by those in authority to assist the apprentice in securing it. He should be offered every assistance possible in securing a thorough knowledge of the M. C. B. rules, especially along the lines of interchange work and building and repair work.

As to the building and repairing of freight equipment cars, I am strongly of the opinion that an apprenticeship system in this department of the car business is not only unnecessary but offers no advantage either to the railroad company or to the men employed in this branch of the service. However, I would advocate the use of helpers, who should be advanced as they qualify themselves to do this class of work. My reason for not advocating an apprenticeship course in the freight car department is as follows: First, there is no incentive for the young man to serve as an apprentice as a freight car builder or repairer because it would be necessary, owing to present conditions, for the boy to work side by side with men who were advanced from freight car helpers to freight car builders and repairers, in a much shorter time than is required in the apprenticeship course. Second, the pay of the freight car builders and repairers being so much out of proportion to the pay in other mechanical lines of railroad work, the railroad companies and the employing heads would have difficulty in securing the services of young men meeting the qualifications which would be required of them.

*This article was awarded first prize in the competion conducted by the association.

CAR DEPARTMENT APPRENTICES*

C. N. Swanson (A., T. & S. F.).—Nowhere is there a greater need for definitely and specifically trained men than in the car department of our railroads. The Santa Fe has been especially successful in training its apprentices and for some time it has been unnecessary for us to go outside our ranks for journeymen or for young men to fill our minor foremanships. In addition to this the system has paid its way in dollars and cents from the start.

The course for the coach carpenter apprentices is four years in length, the boy starting out at $1 or $1.20 per day, according to locality, being given an increase of 15 cents per day every six months. The ages at which the boys are accepted vary between 18 and 22. The work they are given is shown in the following schedule:

Nine months in the cabinet shop.
Nine months on outside coach body work.
Nine months on inside coach finishing work.
Six months on trucks, platforms, piping and steel work.
Six months in freight car work.
Nine more months in the cabinet shop.

The freight car apprentices are given a course of 2½ years. These boys are given a thorough experience first on body work of freight cars requiring light repairs, then on trucks, steel work, and air brake equipment. They are then put back on body work of cars undergoing heavy repairs. These men start out at 16½ or 18 cents per hour and are increased in the same proportion as the coach apprentices. As the freight car work is of a heavier nature than that required of the coach apprentices the age limits are 19 and 30 years.

The apprentices attend school on company time. The carpenter apprentices are taught the fundamental operations of arithmetic, including fractions and how to solve problems in board measure, how to make out a bill of material and to estimate the cost of various jobs; also the correct name and function of the various parts of the car. The freight car carpenter apprentices are taught in addition to this the M. C. B. Rules of Interchange. In brief, each boy is taught every thing that will help him with his particular vocation, but nothing that will detract him from that vocation.

A shop instructor is selected for every 25 apprentice boys and he devotes his whole time to instructing them in the practical side of their work. It is his duty to see that each boy gets a thorough training and to arrange for his transfer from one class of work to another, working, of course, in harmony with the foreman. Great care is taken in selecting these men as the success of the system is dependent largely on them.

The apprentices themselves are also carefully selected. Each applicant is required to pass a physical examination by the company's surgeon which is similar to that required of applicants for life insurance. The boys are also given a school examination, the amount of schooling required depending upon the opportunity each boy has had. In general, however, no boy is accepted who cannot add, subtract, multiply, divide, and deal with simple fractions. We are very insistent that no one enters upon work for which he has no natural fitness or liking. If a boy is found to be unfitted to become a mechanic he is kindly told that he is wasting his time in the shop. We have plenty of applicants, each boy employed being a living advertisement for us.

We have found that our apprenticeship system pays in dollars and cents, in the increased output of the shop even from the start. It pays much more in the number of skilled journeymen who are being prepared to recruit our depleting ranks. The kind and considerate treatment given the apprentices has a wholesome effect on the entire shop. One reason for the success of our apprenticeship system is that it has the unlimited support and backing of the manage-

*This paper was awarded the second prize in the association's competition.

ment. Without such backing it would be hard to install any system of this kind. The average railroad man is too proud of his prerogatives to work in harmony with any system which appears to lessen his authority.

INTERCHANGE INSPECTION

W. H. Sagstetter (Kansas City Southern):—The establishment of more Joint Interchange and Inspection Bureaus will systematize the interchange of cars between railroads and result in large savings. Where they have been established they have been very successful. They should, however, be extended to every point where two roads interchange cars. Where there is a chance of difference of opinion one man responsible to all parties interested should handle all interchange if it is possible to do so. This will improve the movement of both the empty and loaded cars.

Another very important question that should be considered is the promulgation of rules relating to the transfer of loads from cars. There is a great deal of unnecessary transferring done, some on account of ignorance, some on account of a too conservative opinion of the poor condition of the car and a great deal through the spirit of reciprocity. The latter condition usually prevails at points where more than one inspector is located and where each suspects the other of making transfers on technicalities and tries to get even. In such cases the railroads hold the sack and pay the money. One of the principal causes for transferred loads is elongated holes in draft sills. Why not set definite limits of 2 or 2½ in. before a transfer should be made? Another matter that needs consideration is the carding of cars on technicalities. Take a raked siding, for instance. Could not a limit be set as to the depth to which the siding is cut before a card is made?

W. H. Bettcher (C. I. & W.).—The importance of strictly adhering to the loading rules cannot be overestimated. The result of improper loading may be the cause of serious accident, badly damaged equipment and costly claims. If shipments improperly loaded are allowed off the home rails there is very liable to be a charge for reloading coming from some interchange point which not only is costly, but causes delays to the shipment. Every effort should be made to educate the shippers as to the proper method of loading their carload shipments and in most cases they will not be adverse to doing the work properly as it is to their best interest to have it done so.

M. C. B. BILLING

To appreciate the importance of M. C. B. billing in railroad work one must take into consideration the number of cars involved. D. R. MacBain, president of the M. C. B. Association, in his opening address called attention to the fact that the members of the association represented 2,853,482 cars. As a general proposition these cars are passed from one road to another throughout the country, often remaining away practically the entire life of the car, and they must be maintained, and by roads other than the owner. One large railroad owned approximately 5,000 cars more than the average number of cars handled by it, but, in spite of this, between 50 per cent and 65 per cent of the cars handled were other than its own equipment. It is essential, therefore, that an up-to-date method of accounting for repairs be maintained. There are various methods in which the information is obtained. Some cars require only very minor repairs, while others require repairs of an extensive nature; therefore, one road is very likely to use two different forms on which the original record is taken.

A material checker is very essential in a large organization to insure proper information being recorded, also to determine whether or not the repairs are properly chargeable to the owner. On some roads it appears to be the practice for the repair work inspector or material checker to make what is commonly known as an M. C. B. billing repair card; also to make the extensions as to the size of material, kind, weight, feet of lumber, etc., and the number of hours chargeable in accordance with M. C. B. Rules, while others only require the repair work inspector or material checker to furnish information as to repairs and size of material used, and clerks at shops are required to fill in billing repair cards, make the extensions as to the weights, number of feet of lumber, hours labor, etc., chargeable.

Each of these systems has its advantages. In having the repair work inspector or material checker fill in the information he is more familiar with the car and, therefore, more likely to enter the information correctly; also if he is required to enter the information there will be a tendency to be more careful to see that all the material used is charged, and as it necessarily involves more direct application of the rules, there is less liability of erroneous charges being made. The advantage in having clerks fill in the billing repair cards, and likewise make the extensions as to the charges under M. C. B. Rules, is that all such men's time would be required to compile the information and they would become expert, consequently giving a greater output. Also it is good training for making the future inspector, foreman or M. C. B. billing clerk in general offices or accounting departments. There is still another system prevalent as to making the extensions on the billing repair card, and that is to have all the billing repair cards properly filled in as to the kind and size of material used, after which the cards are sent to some central office and clerks there make the material and labor extensions and prepare the card preparatory to making the bill. Two general methods prevail in checking the bills. In one the bills of foreign roads are checked in the same office that renders the bills, whereas in the other the bills are checked by a different organization entirely. The only advantage the one has over the other is that if clerks are assigned to check bills of the roads for which they have been assigned to render the bill, a more uniform manner of billing and checking prevails and the possibility of contentions can be averted as the billing clerk knows in the preparation of his charge that under the same condition the road against whom he is preparing the bill would prepare a like bill.

The best methods to bring about accuracy in billing are to have a system of surprise checks, either by one delegated exclusively for this purpose, by a division officer when making his periodical visits, or by the material checkers or M. C. B. billing clerks of different stations. If either of these practices are followed good results will be obtained. The work can be facilitated by the least complicated system, but any system is a failure unless it is properly supervised, as in the billing for repairs a number of different men enter into the practice. The report was signed by J. V. Berg, chairman; E. A. Eyman and F. A. Rawley.

Other Business

Several other papers were received by the convention that were of particular interest to car repair and maintenance forces. These will be published in the Railway Mechanical Engineer for November. The by-laws were amended to include in the active membership of the association car department officers, car foremen, chief interchange inspectors, chief car inspectors, chief clerks, chief M. C. B. billing clerks and representatives of any private car line working in the same capacity as described above. Car inspectors, air brake inspectors and representatives of railway supply firms are to be admitted as associate members.

The secretary-treasurer reported a membership of 554 and a cash balance of $379. The following officers were elected for the ensuing year: President, W. J. Stoll, chief interchange inspector, Toledo, Ohio; first vice-president, J. J. Gainey, general car inspector, C. N. O. & T. P.; second vice-president, E. Pendleton, chief interchange inspector, Peoria, Ill.; secretary-treasurer, W. R. McMunn, general car inspector, New York Central, Albany, N. Y.

General News Department

The department of safety of the St. Louis-San Francisco has extended the scope of its work by the appointment of two new safety inspectors, David Smith and W. F. Morrison. Mr. Smith will study shop conditions and Mr. Morrison train service.

C. C. Lary, agent of the Southern Pacific at Visalia, Cal., has induced the school board of the town to redivide the school districts so as to make the Southern Pacific tracks a dividing line, thus obviating the necessity of school children crossing the railroad.

The Baltimore & Ohio, following the recommendation of the United States Board of Mediation and Conciliation has increased the pay of telegraphers an average of 8.2 per cent, and has made changes in working conditions. About 1,600 operators are affected.

Figures compiled by the United States Geological Survey show that 128,200,000 tons of coal or 24 per cent of the total domestic output was consumed by the railroads of the United States in 1915. This is an increase of 31,000,000 tons over the amount used in the year 1914.

The Interstate Commerce Commission has granted permission to the Louisville & Nashville to make use of new box cars which are to move over its line from Cincinnati, to be delivered to the Southern Pacific at New Orleans. The Louisville & Nashville will pay the freight charges on the cars from Columbus, Ohio, to Cincinnati.

The Southern Railway has issued a statement showing that, according to figures announced by Controller A. H. Plant, for every dollar paid to the Southern Railway in freight and passenger rates by the people of the South during the month of August, the Southern Railway paid out in the South $1.12 for labor, materials and supplies and for other purposes. The railway's total disbursements during the month for these expenses were $6,088,749, of which 85 per cent was paid to individuals and industries located in the South. This sum was $637,653 in excess of the total money paid by the South to the railroad for transportation purposes.

Secretary McGinty, of the Interstate Commerce Commission, has written a letter to the National Board of Fire Underwriters, New York, in reply to a request that the commission make an investigation of the recent fire and explosion at Black Tom Island, near New York City. He points out that the commission does not consider this occurrence such an accident as is plainly contemplated by the act authorizing the commission to investigate collisions and other accidents on the lines of common carriers; that it sent an inspector to the scene immediately following the accident to make a report, and that it does not feel that it has any duty to conduct a further investigation.

The Hudson & Manhattan Railroad, operating the tunnel railways between New York, Jersey City and Hoboken, and running trains also through to Newark, N. J., over the tracks of the Pennsylvania, last week discharged 40 guards (trainmen) because they were agitators; and the Brotherhood of Railway Trainmen is said to be preparing to go to the railroad company to get the men taken back. Within the past two months the officers of the Hudson & Manhattan have been guiding the formation of a union among the men in its own service, and it is said that those now discharged had tried to induce their associates to desert the local association, and join the Brotherhood of Railway Trainmen.

According to the Bulletin of the Southern Pacific, one of the agents of the system uses the following methods to facilitate the loading and unloading of cars at his station: whenever possible consignees are persuaded to unload cars first from one end only so that when a sufficient space is cleared a shipper may start loading. Warehouse men of the company are likewise instructed to unload merchandise cars at one end so that loading can be started, if necessary, before the unloading work is completed. If the commodity being unloaded is of a nature that it is liable to become mixed with the commodity that is to be loaded, necessary precautions are taken so that no confusion and complaints on account of shipments being exchanged will result.

The attorneys for the committee on railway mail pay filed a petition with the Interstate Commerce Commission Tuesday, asking that the commission issue an order prescribing the conditions under which a test of the space basis of compensating the railways for handling mails proposed by the postmaster general to begin November 1 is to be conducted. They ask for an order providing for preliminary weighing before the space test is installed, and prescribing that during the entire period of the space test concurrent weighings shall be taken, and providing also for other statistics to be kept contemporaneously and continuously during period of preliminary weighing, and during the test. If the commission is unable to enter an appropriate order before November 1 the petition asks it to rescind its consent for the space test until an appropriate order can be made. The petition points out that the law contemplates the test for the purpose of giving the commission information on the comparative merits of the space and weight systems, and that the postmaster general proposes to install the space basis on practically all mail routes, and that the commission has given its approval on ex parte statements of the postmaster general without giving the railways a hearing.

Luncheons in the Coaches

The Union Pacific now provides food for passengers in chair cars and tourist sleepers. The arrangement is called the "Off-the-Tray" service. Passengers who do not care to go to the dining car may take the "Off-the-Tray" service at a less cost. Waiters bearing large trays pass through the cars, offering various kinds of sandwiches and hard-boiled eggs, hot coffee, fruit, pies and cakes. The service is especially adapted to the convenience of women, particularly when they have children with them. The menu offered, of course, includes milk for the children.

In Behalf of the Eighty Per Cent

R. T. Frazier, Jr., of the Nashville, Chattanooga & St. Louis, and P. W. Waldon, of the Chicago and Alton, who originated, circulated and carried to Washington a petition on behalf of the 80 per cent of American railway employees, who were not in the recent wage movement, asking President Wilson to cause arbitration of the trainmen's demands, have issued a statement showing that President Wilson refused to give them a hearing during the negotiations in Washington, and attacking the Adamson law. They declare that—

"This law absolutely ignores the rights, the welfare and even the existence of the other 80 per cent of railway employees; and Congress, by voting a 25 per cent increase of wages to 20 per cent of the railway employees—and these the very highest paid men in the service—necessarily has rendered it more difficult, perhaps impossible, for the railway companies to make improvements in the wages and the conditions of work of other other 80 per cent"; that "they do not think that the enactment of the Adamson law is in accordance with the fundamental principles of the American nation; and believe that, inasmuch as the government has taken jurisdiction of the matter, we should, as citizens, appeal to the President and Congress, at the next session of Congress, and insist that all railway employees be considered; and that a commission be appointed to investigate all hours of service and wages of all employees."

Copies of the letters, which passed between Mr. Frazier and President Wilson, in which Mr. Frazier appealed to the President for an opportunity to present the claims of the 80 per cent, and the President refused to see him, are appended to the statement.

REVENUES AND EXPENSES OF RAILWAYS

Two Months of Fiscal Year 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Alabama & Vicksburg	143	$177,866	$79,389	$285,907	$35,836	$63,131	$7,187	$97,301	$4,648	$12,680	$220,783	$65,123	$17,200	$47,923	$18,132
Arizona Eastern	378	574,122	87,654	702,536	88,143	65,030	4,765	129,516	4,395	26,920	318,418	384,118	32,801	351,304	125,719
Atchison, Topeka & Santa Fe	8,648	14,621,392	5,063,305	21,209,367	2,741,168	3,171,206	369,289	5,405,101	1,566	385,249	12,048,264	9,161,103	947,280	8,210,808	1,706,727
Baltimore, Chesapeake & Atlantic	88	194,191	125,467	332,527	24,708	58,554	5,597	141,983	.....	4,996	235,789	96,738	4,600	92,130	18,017
Belt Ry. Co. of Chicago	31	.....	.....	519,635	38,120	66,848	2,989	199,123	.....	11,856	318,937	200,698	26,889	173,808	20,230
Bessemer & Lake Erie	205	2,538,649	91,809	2,665,417	174,689	392,320	21,311	564,849	.....	27,151	1,144,968	1,520,449	44,030	1,476,409	—49,491
Buffalo & Susquehanna R. R. Corporation	253	274,683	12,882	293,210	44,076	64,595	2,619	78,276	.....	10,952	200,517	92,692	5,200	87,491	42,852
Buffalo, Rochester & Pittsburgh	586	1,981,326	246,084	2,323,345	320,638	512,816	28,165	710,518	3,343	44,511	1,619,992	703,353	44,000	659,360	162,630
Central of Georgia	1,924	1,407,693	615,270	2,234,462	343,437	387,000	80,661	689,574	1,547	81,684	1,580,657	653,806	115,864	537,001	192,035
Central New England	301	865,861	88,984	1,001,895	96,315	92,674	2,426	254,919	.....	11,647	457,963	543,932	30,500	513,425	185,511
Charleston & Western Carolina	342	181,455	63,676	263,237	54,345	50,177	8,276	87,967	.....	7,877	208,476	54,762	10,000	44,303	17,668
Chesapeake & Ohio Lines	2,381	6,430,319	1,280,221	8,279,586	1,036,384	1,512,955	114,298	2,227,258	61,421	167,888	5,116,246	3,163,340	254,840	2,908,461	405,765
Chicago & Alton	1,053	2,076,893	816,361	3,114,124	363,572	610,381	80,152	954,129	22,288	64,407	2,085,635	1,028,489	92,221	934,830	349,839
Chicago & North Western	8,108	10,812,369	4,420,290	17,094,796	2,334,324	2,486,191	239,930	5,586,974	123,404	328,340	11,007,319	6,087,477	845,000	5,241,865	1,975,564
Chicago Junction	13	.....	.....	412,495	44,952	37,578	2,382	223,566	.....	9,774	318,252	94,243	7,292	86,950	14,010
Chicago, Milwaukee & St. Paul	10,208	13,294,427	3,974,781	19,257,582	2,133,124	2,675,368	364,591	6,377,189	140,393	331,243	11,783,574	7,474,008	979,046	6,486,103	1,167,164
Chicago, Rock Island & Gulf	477	420,709	141,941	602,597	102,068	77,621	19,943	180,135	2,137	18,080	399,933	202,664	17,152	185,290	112,985
Chicago, St. Paul, Minn. & Omaha	1,753	2,032,303	1,057,493	3,360,064	463,529	453,959	62,700	1,147,836	33,981	82,663	2,240,491	1,119,574	174,119	944,097	283,731
Chicago, Terre Haute & Southeastern	373	411,702	34,788	458,349	62,647	154,967	7,933	123,225	2,262	15,488	366,230	92,119	21,767	70,352	2,817
Cincinnati Northern	246	293,406	44,868	351,037	52,320	56,016	7,405	100,596	.....	5,544	221,881	129,156	12,000	117,155	52,068
Cleveland, Cincinnati, Chic. & St. Louis	2,384	5,395,329	2,028,948	8,092,727	927,118	1,510,178	189,533	2,524,492	53,211	151,180	5,340,102	2,752,625	298,000	2,453,401	607,930
Colorado Midland	338	226,655	63,681	316,820	67,974	58,350	15,020	125,900	4,344	10,832	282,420	34,401	18,000	16,401	40,210
Duluth & Iron Range	277	1,904,832	45,257	2,013,159	171,159	151,017	2,865	386,274	4,471	22,869	735,706	1,277,453	109,023	1,168,431	99,821
Duluth, Missabe & Northern	411	3,728,723	67,050	3,981,622	272,627	220,244	6,216	584,774	1,896	22,712	1,108,470	2,873,152	215,988	2,657,164	671,255
El Paso & Southwestern Co.	1,028	1,699,448	418,955	2,228,441	213,095	235,777	35,901	492,491	13,301	50,382	1,040,947	1,187,494	79,058	1,108,426	599,006
Florida East Coast	745	773,636	212,791	1,094,540	112,118	158,713	13,619	329,911	6,290	32,521	649,910	444,630	52,015	392,553	308,293
Galveston, Harrisburg & San Antonio	1,361	1,872,982	615,978	2,630,375	326,960	348,315	60,975	823,311	19,460	75,359	1,645,066	985,309	97,004	887,376	496,427
Georgia, Southern & Florida	395	232,251	119,368	393,087	53,421	79,532	15,719	144,721	45	16,832	310,260	82,827	22,229	60,395	8,907
Grand Rapids & Indiana	575	580,089	409,734	1,085,677	129,448	159,676	19,942	408,677	7,107	34,315	759,165	326,512	48,162	278,297	25,473
Houston, East & West Texas	191	180,845	63,533	260,817	49,229	36,004	4,394	81,758	1,630	6,455	179,267	81,551	10,721	70,704	42,832
Houston & Texas Central	895	862,454	317,993	1,259,879	167,727	177,366	31,894	371,946	9,925	36,001	791,676	468,203	61,330	406,623	201,438
Illinois Central	4,767	8,622,479	2,577,657	12,336,600	1,833,650	3,201,376	218,158	3,563,296	67,429	315,745	9,167,261	3,169,339	673,000	2,493,274	838,417
Indiana Harbor Belt	109	.....	.....	780,874	96,160	94,058	5,491	283,096	.....	15,827	494,631	286,242	15,121	271,047	105,132
Kanawha & Michigan	177	529,954	74,059	620,706	93,479	157,243	6,321	148,849	28	13,505	419,425	201,282	28,400	172,881	—14,000
Kansas City Southern	837	1,387,972	319,490	1,885,584	181,047	249,123	52,694	548,145	.....	68,296	1,096,369	789,215	96,530	691,681	83,365
Lake Erie & Western	900	1,076,716	155,437	1,305,005	134,303	207,403	27,042	390,013	.....	24,733	783,493	521,511	54,000	467,371	232,763
Lehigh & New England	296	425,224	2,753	460,397	78,722	73,875	3,755	126,900	.....	11,186	294,278	166,119	17,640	148,457	—142,268
Lehigh Valley	1,444	7,118,792	1,022,014	8,743,143	1,146,192	1,447,486	167,520	3,049,860	34,591	164,169	6,005,958	2,737,185	306,500	2,429,424	310,403
Long Island	397	712,673	2,146,231	3,287,576	289,656	282,583	34,152	1,042,128	12,344	66,047	1,724,346	1,563,230	143,810	1,418,406	132,827
Louisiana Ry. & Navigation Co.	350	279,387	52,389	350,012	54,616	41,426	13,465	110,256	.....	13,264	233,027	116,985	22,000	94,980	15,488
Louisiana Western	208	250,179	121,434	396,952	46,311	67,270	14,317	96,818	3,352	13,597	241,644	155,303	21,350	133,700	65,780
Louisville & Nashville	5,071	7,740,063	2,312,552	10,752,443	1,516,943	2,026,086	239,209	3,075,497	37,612	222,560	7,101,189	3,651,254	425,265	3,224,687	717,850
Louisville, Henderson & St. Louis	200	185,924	83,434	287,124	50,011	44,988	9,849	81,514	.....	5,677	192,038	95,086	7,600	87,432	55,308
Maine Central	1,221	1,278,792	809,162	2,269,763	301,569	282,442	30,168	809,628	19,765	57,315	1,500,519	769,244	99,199	669,976	87,790
Midland Valley	385	259,269	88,531	359,825	71,732	61,657	5,506	97,529	.....	13,757	250,007	109,818	11,868	97,587	19,568
Missouri & North Arkansas	365	142,615	84,926	242,487	30,822	23,808	7,189	71,856	.....	9,595	143,271	99,216	9,600	89,603	79,099
Missouri, Kansas & Texas System	3,865	4,208,518	1,743,716	6,371,859	1,240,404	1,209,212	116,755	1,995,671	43,522	196,570	4,797,921	1,573,938	250,458	1,317,132	169,019
Monongahela	108	308,372	21,586	336,130	52,522	23,361	1,475	73,260	.....	8,317	158,935	177,196	8,000	169,196	28,789
Monongahela Connecting	6	.....	.....	228,907	33,897	29,124	600	109,436	.....	5,785	178,843	50,064	4,616	—53,429	—92,289
Morgan's La. & Texas R. R. & S. S. Co.	401	483,667	185,610	723,234	115,877	147,414	22,324	255,663	4,194	23,280	567,682	155,552	46,583	108,751	65,405
Nashville, Chattanooga & St. Louis	1,237	1,559,577	542,825	2,266,307	272,031	433,172	104,542	735,728	16,153	73,448	1,633,613	632,694	57,000	574,759	168,775
New Orleans & North Eastern	204	453,169	114,971	635,125	74,875	116,600	19,678	187,293	14,293	24,357	437,095	198,030	31,400	166,630	29,870
New Orleans, Mobile & Chicago	402	257,402	57,046	329,807	54,004	49,537	8,314	104,768	288	13,202	230,114	99,693	12,981	86,586	24,481
New York, New Haven & Hartford	2,005	6,771,818	5,596,619	14,117,077	1,574,308	1,674,753	93,641	5,005,696	178,357	333,950	8,859,282	5,257,796	514,000	4,743,267	473,467
New York, Philadelphia & Norfolk	112	817,392	108,282	999,822	82,954	202,031	8,779	324,696	10,366	22,718	650,954	348,869	26,000	322,698	64,636
Norfolk & Western	2,086	8,596,612	1,128,740	10,188,134	1,414,058	1,718,559	123,429	2,418,467	18,784	167,913	5,815,268	4,372,866	410,000	3,962,672	462,666
Northern Pacific	6,505	9,645,716	2,872,401	13,773,289	2,062,372	1,536,838	214,785	3,598,396	198,240	213,898	7,706,406	6,066,883	903,364	5,161,056	1,335,906
Pennsylvania Company	1,755	10,505,538	2,292,817	14,197,062	1,603,332	2,195,482	183,868	4,312,716	75,756	296,656	8,644,976	5,552,086	595,026	4,954,265	1,018,242
Pennsylvania Railroad	4,534	28,322,512	8,447,047	40,304,730	4,936,821	7,577,438	419,233	13,293,063	538,270	969,429	27,724,167	12,580,563	1,477,688	11,093,841	1,027,909

REVENUES AND EXPENSES OF RAILWAYS

TWO MONTHS OF FISCAL YEAR 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Pere Marquette	2,249	$2,421,200	$949,045	$3,756,236	$361,377	$674,318	$74,634	$1,225,493	$11,639	$84,176	$2,430,687	$1,325,549	$102,853	$1,222,156	$354,294
Philadelphia, Baltimore & Washington	717	2,405,561	1,692,151	4,488,029	560,094	852,922	57,312	1,679,847	200	108,403	3,256,142	1,231,887	128,196	1,103,356	186,661
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	5,994,728	1,759,312	8,744,309	1,209,789	1,653,750	148,710	2,730,692	56,116	207,924	6,004,239	2,740,070	348,862	2,390,081	504,641
Richmond, Fredericksburg & Potomac	88	370,112	178,271	608,959	36,316	76,935	7,803	186,282	4,295	15,393	327,024	281,935	19,632	262,281	75,904
Rutland	468	344,522	249,052	693,515	91,324	109,627	21,294	225,167	2,364	13,493	463,273	230,241	34,404	195,838	164,397
St. Joseph & Grand Island	258	287,519	60,274	372,284	57,086	45,612	8,773	102,511	921	9,673	224,574	147,710	15,916	131,743	110,702
St. Louis & San Francisco	4,752	5,938,586	2,424,783	8,907,093	1,271,613	1,943,580	137,360	2,662,402	.....	219,289	6,180,396	2,726,697	347,313	2,375,547	401,571
St. Louis, Brownsville & Mexico	548	497,801	362,636	923,892	114,143	86,021	17,037	248,025	.....	19,816	484,027	439,865	16,000	423,416	295,531
St. Louis Merchants' Bridge Terminal	9	.....	727	424,985	68,098	25,813	1,596	170,008	.....	13,657	279,171	145,814	15,200	130,594	50,579
St. Louis Southwestern	943	1,064,034	295,266	1,441,126	109,080	244,964	62,432	348,274	6,287	48,804	819,628	621,498	76,243	544,905	180,005
San Antonio & Aransas Pass	726	437,150	216,315	697,954	112,607	93,886	15,242	286,167	.....	25,667	533,017	164,938	40,000	124,929	95,819
Seaboard	3,449	2,432,472	881,882	3,660,700	513,800	618,769	139,552	1,303,064	20,532	123,164	2,718,881	941,819	207,506	733,367	.....
Tennessee Central	295	201,516	78,600	295,316	47,982	39,674	11,321	101,184	.....	13,459	213,620	81,696	9,132	72,555	24,154
Terminal R. R. Ass'n of St. Louis	37	.....	501	461,134	55,191	35,616	1,751	139,209	.....	5,292	237,059	224,075	54,969	168,408	4,849
Texas & New Orleans	468	535,401	194,607	798,721	101,804	150,967	15,491	238,899	24,953	21,465	553,037	245,664	39,740	205,457	100,281
Texas & Pacific	1,944	2,070,821	939,466	3,233,582	384,994	414,443	81,695	1,143,802	22,898	111,997	2,156,731	1,076,850	159,500	916,836	317,874
Toledo, Peoria & Western	248	108,835	74,214	200,684	34,031	57,002	3,984	72,997	.....	6,178	176,192	24,492	13,000	11,492	4,989
Toledo, St. Louis & Western	451	834,918	121,159	1,010,582	144,809	145,352	32,565	306,502	.....	17,453	644,641	365,940	36,500	329,440	96,770
Union R. R. of Baltimore	8	275,701	51,737	331,341	24,887	.....	.....	10,966	.....	4,860	40,713	290,628	13,744	276,883	87,381
Union R. R. of Pennsylvania	32	.....	.....	1,138,810	63,457	183,147	217	420,542	.....	8,098	674,423	464,387	16,701	447,686	—977
Vandalia	917	1,482,103	489,364	2,233,758	376,791	427,541	51,696	732,501	22,284	55,101	1,663,785	569,973	80,348	489,020	51,587
Vicksburg, Shreveport & Pacific	171	154,196	86,481	270,517	39,828	55,262	7,867	86,238	4,110	10,149	203,455	67,062	18,360	48,702	25,605
Virginian	510	1,199,514	93,052	1,381,733	157,436	226,590	10,982	283,988	32,297	30,626	741,155	640,578	60,000	580,547	50,427
Wabash	2,519	4,271,166	1,473,210	6,274,847	644,896	1,014,810	182,179	2,136,589	40,779	137,049	4,135,144	2,139,703	197,688	1,941,443	693,618
Washington Southern	36	122,436	101,089	286,548	23,655	30,244	2,856	90,198	1,911	6,895	155,760	130,788	8,093	122,692	47,020
West Jersey & Seashore	359	412,446	1,545,886	2,102,867	267,869	220,814	25,682	602,327	6,605	37,081	1,160,263	942,604	76,374	866,161	47,952
Yazoo & Mississippi Valley	1,382	1,730,067	450,290	2,302,242	407,125	369,485	42,544	693,310	3,454	65,492	1,572,623	729,619	114,000	615,353	230,161

Five Thousand Dollars Fine

The Abilene & Southern was indicted at Abilene, Texas, last Monday on five counts for violation of the Interstate Commerce law by defeating the lawful freight rate applicable on shipments of the company's own material. The company pleaded guilty and was fined $5,000. The material had been billed to a point 20 miles from the actual point of delivery, thereby reducing the rate.

Street Car Disasters

In the derailment of a street car on or near a bridge in West Third street, Cleveland, Ohio, October 3, the conductor and one passenger were killed and forty or more persons were injured. The car, when knocked off the track, ran against a truss of the bridge and weakened it, and the whole structure, with two cars, fell, about 30 feet, to the tracks of the Baltimore & Ohio, below. The collision appears to have been due to the car becoming uncontrollable on a steep descending grade.

By the wrecking of a street car on a crossing of the Grand Trunk in Detroit, Mich., on the night of the first of October, 14 persons were killed and 20 or more injured. A switching engine, pushing two freight cars, struck the street car at Forest avenue. The street car was pushed along at one side of the freight cars for some distance, and the killed were mostly persons who jumped or fell under the moving freight cars.

A Question of "Guests"

A correspondent at Pierre, S. D., anticipates the Court News column as follows:

"A peculiar suit is in process of incubation in Hutchinson county, this state, as to the rights of railways under certain conditions. The Chicago, Milwaukee & St. Paul is the road which is used by transient 'harvest hands' in their annual pilgrimage into this country, and several months ago, in a freight wreck, which occurred in Hutchinson county, three of such travelers were killed and about thirty more or less injured. The injured were taken to a hospital at Yankton for care and attention; and now the railway company takes the position that as the injuries occurred in Hutchinson county, that county is liable for the hospital expenses of the injured men. The county claims that the men were not residents of the county, and were merely passing through, as 'guests' of the railway company, and there is no responsibility. The outcome will be a suit to find what the courts think as to the rights of the contending parties."

Chinese Railway Contract to Americans

The Chinese government on September 30 entered into an agreement with the Siems-Carey Railway & Canal Company, St. Paul, Minn., which company will be financed by the American International Corporation of New York for the construction of 1,100 miles of railway. The railroad lines to be constructed have not yet been decided upon, but will be located by George A. Kyle, who has been appointed engineer, and officials of the Chinese government. The contract provides for the construction of 1,100 miles of road between points to be agreed upon after investigation. When the line to be first constructed has been agreed upon the road will be built by the contractors on a percentage basis. Mr. Kyle, in addition to surveying and locating the lines, will on behalf of the Chinese government superintend the construction, which will be undertaken by the Siems-Carey Railway & Canal Company. It is said that he will act later as chief engineer of the railroad. The Chinese government agreed further to appoint an American auditor, who shall act during construction and operation, as well as an American traffic manager. The contract mentions certain points between which the Chinese government desires lines to be constructed. It is provided, however, that if the construction of these lines is, after investigation, deemed to be inadvisable, the government and the corporation shall agree upon other lines to be constructed to make up the total mileage agreed upon. The American International Corporation has already advanced $500,000 to the Chinese government to be utilized in investigation, survey and location of lines and other preliminary expenses.

The Chinese government and the American International Corporation, in selecting lines for construction, will take pains to avoid interfering with any agreements covering railway construction which have been entered into by the Chinese govern-

ment with the various foreign governments or banking groups. At the present time there are only about 6,000 miles of railroad in China. While a number of roads have been contemplated, they are more or less covered by agreements of the character referred to. The roads already built have been found extremely profitable. China has been sadly lacking in transportation facilities, and wherever these have been improved, immediate increases in business have resulted. There are at present numerous lines which are desired and whose operation it is believed would be at once profitable.

The Siems-Carey Railway & Canal Company was organized recently by the American International Corporation and Siems & Carey, of St. Paul, Minn., undertaking railway and canal work in China. A preliminary contract for the dredging of the grand canal has been concluded, but the final contract is not yet signed. It is estimated that this work will cost somewhere in the neighborhood of $6,000,000.

Chief Interchange Car Inspectors' and Car Foremen's Association

At the recent convention of the Chief Interchange Car Inspectors' and Car Foremen's Association, which was held in Indianapolis, Ind., October 3 to 5, a report of which will be found elsewhere in this issue, the following supply companies had exhibits:

American Steel Foundries, Chicago.—Exhibiting models of the Economy draft arm, reversible coupler pocket with adjustable shelf, Simplex coupler, Vulcan truck sides, Vulcan, Hercules and Ajax brake beams, Atlas safety guards and the Ajax third point support. Represented by M. DeAndrews, F. L. McCune and W. G. Wallace.

Boss Nut Company, Chicago.—Exhibiting Boss lock nuts. Represented by J. W. Fogg and W. G. Wilcoxson.

Gold Car Heating and Lighting Company, New York.—Exhibiting steam hose couplers, brass gaskets, vapor valve, twin inlet valve and a model of a thermostatic regulator for steam heats. Represented by A. E. Robbins.

Grip Nut Company, Chicago.—Exhibiting locomotive, car and Unit Grip nuts, and test demonstrations with a Riehle testing machine, showing the wearing qualities of Grip nuts. Represented by W. C. Fowler, Jr., Albert Roberts and C. J. Wymer.

Joyce Cridland Company, Dayton, Ohio.—Exhibiting inspector jacks. Represented by Charles D. Derby.

Mahr Manufacturing Company, Minneapolis, Minn.—Exhibiting No. 1-C portable steel car repair torch. Represented by H. H. Warner.

Q & C Company, New York.—Exhibiting portable derails and the Peffers air brake hose protector. Represented by Albert Herbster.

Western Railway Equipment Company, St. Louis, Mo.—Exhibiting models of the "Perfect" brake ratchet, "Western" angle cock holder, "Spiral" pipe clamp, and other car devices. Represented by R. L. Langtin.

Templeton, Kenly & Company, Ltd., Chicago.—Exhibiting Simplex jacks, wrecking car jacks and emergency jacks. Represented by Arthur S. Beattys.

American Association of Passenger Traffic Officers

The sixty-first annual convention of the American Association of Passenger Traffic Officers will be held at the New Willard Hotel, Washington, D. C., on October 17 and 18. In addition to the reports from standing and special committees, the subjects to be discussed include Placing of Prepaid Orders by Telegraph or Telephone, Operation and Charges for Dining Cars, Uniformity in Contracts for Inter-line Tickets, Association Multi-route Tickets, Co-Operation in Advertising, Economy in Folder Distribution, City Ticket Office Location, and Checking Baggage to Residence. The program also includes addresses by Frank Trumbull, chairman of the board of the Chesapeake & Ohio; by Harry A. Roemer, traveling passenger agent of the Chicago, Milwaukee & St. Paul, on "The Get-Together Spirit," and by Henry R. Martin, general ticket agent, Union station, Indianapolis, on "Prepaid Ticket Deliveries."

Society of Railway Financial Officers

The annual convention of the Society of Railway Financial Officers will be held at the Hotel Raleigh, Washington, D. C., on October 18, 19 and 20.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

American Railway Association.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, Gruenwald Hotel, New Orleans, La.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

Association of Manufacturers of Chilled Car Wheels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

Association of Transportation and Car Accounting Officers.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

Bridge and Building Supply Men's Association.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August. Windsor Hotel, Montreal, Que.

Canadian Society of Civil Engineers.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

Cincinnati Railway Club.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

General Superintendents' Association of Chicago.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856. Transportation Bldg., Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Railroad Club.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, December, 1916, Waldorf-Astoria Hotel, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

Railway Development Association.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.

Railway Real Estate Association.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, Hotel Sherman, Chicago.

Richmond Railroad Club.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Society of Railway Financial Officers.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Hotel Raleigh, Washington, D. C.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transportation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Association of Short Line Railroads.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

There were 3,500 more commuters over the lines of the Long Island in the month of September, 1916, than during the corresponding month of 1915.

Because of heavy sleeping car travel on the Pioneer Limited between Chicago and St. Paul, the Chicago, Milwaukee & St. Paul has assigned a second dining car to that train.

The Trunk Line railroads carrying grain from Lake Erie ports to New York announce an increase of one cent per 100 lb. on wheat for export, beginning November 1. Advances are proposed also in the rates on barley, rye, corn, oats and flaxseed.

The Texas railways have filed tariffs with the Interstate Commerce Commission to become effective on November 1, increasing rates in East Texas in accordance with the order of the Interstate Commerce Commission issued last July in the Shreveport rate case.

Cattle, hogs and sheep are now being grown in the South to such an extent that the Southern Railway runs a daily live stock train from points in Western North Carolina, East Tennessee and Southwest Virginia to eastern and southern markets and to Virginia feeding grounds; and from Alabama points to the St. Louis, Louisville and Cincinnati markets. Stock going East is consolidated at Asheville and the animals are fed and rested at Spencer. Stock for St. Louis is concentrated at Birmingham and sent to St. Louis over the Mobile & Ohio.

The Southern Pacific, the Atchison, Topeka & Santa Fe and the Western Pacific have announced changes in miscellaneous transcontinental freight rates, to become effective November 24. The rate on oleo oil and oleo stearines in packages, minimum carload 36,000 lb., from California terminals and intermediate points to all eastern territory, will be reduced to $1.25 per 100 lb. Reductions are announced in packing house products, brick and cement, iron and steel forms and molds, concrete construction and window glass for export. A reduction on west-bound crude or calcined magnesite also is announced. Transit privileges have been granted to shippers of fresh vegetables and fruits. Other commodities affected by the change in rates are tobacco, steel fence posts, toy drums, tea, spineless cactus, imported pickled sheep pelts, bichromate of soda, thermos bottles, barley and kelp. Some of the rates were changed to conform with the rates now in force in Oregon and Washington and others were established on application of California shippers to favor new industries in that state.

The increases in local freight rates announced by the New York State Public Service Commission, second district, last week are the subject of a more detailed statement in the bulletin issued by the commission this week. Examples of the changes shown in the new tariffs are given in the following table, showing rates on freight from Buffalo, to Dunkirk, Westfield, Cherry Valley and Jamestown:

		Classes					
		1	2	3	4	5	6
Dunkirk, N. Y. (N. Y. C.)	Proposed rates	22.5	19.	14.5	10.	8.	6.
	Present rates	12.6	12.1	11.	8.9	6.8	5.3
	Rate advances	9.9	6.9	3.5	1.1	1.2	.7
Dunkirk, N. Y. (N. Y. C. & St. L.)	Proposed rates	20.	16.5	14.	9.5	7.5	6.
	Present rates	12.6	12.1	11.	8.9	6.8	5.3
	Rate advances	7.4	4.4	3.	.6	.7	.7
Westfield, N. Y. (N. Y. C. or N. Y. C. & St. L.)	Proposed rates	26.	22.	17.	11.5	9.	7.
	Present rates	15.2	13.7	12.6	10.5	7.9	6.8
	Rate advances	10.8	8.3	4.4	1.	1.1	.2
Cherry Valley, N. Y. (Erie)	Proposed rates	24.5	20.5	15.5	10.5	8.5	6.5
	Present rates	18.9	16.8	15.8	11.	8.4	7.4
	Rate advances	5.6	3.7	....	....	.1	....
	Rate reductions	....	....	.3	.5	....	.9
Jamestown, N. Y. (Erie)	Proposed rates	29.	25.	19.	13.	10.5	8.
	Present rates	23.1	21.	17.9	12.6	9.5	8.4
	Rate advances	5.9	4.	1.1	.4	1.	....
	Rate reductions	....	....	....	....	....	.4

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has denied a large number of applications filed by the Union Pacific for authority to continue rates without observing the long and short haul clause.

The Interstate Commerce Commission has issued an amended order on the fourth section application of A. C. Fonda, agent for the Texas lines, authorizing these carriers to establish class and commodity rates between Shreveport, La., and Texas points without observing the long and short haul clause, pending action of the commission on the application.

The Interstate Commerce Commission has announced the reopening of the coal and coke rate case because the parties have been unable to agree on the division of the rates prescribed, and the Louisville & Nashville has asked the commission to prescribe such divisions. The hearing has been set for November 1 at Louisville, Ky., before Commissioner McChord.

The Interstate Commerce Commission has suspended from October 10 and 20 until February 7, 1917, the operation of certain items of tariff filed by Joseph Richardson, agent, providing for the withdrawal of rates and charges now in effect for the movement of special baggage and passenger cars from, to and between points located on the Southern Railway in Mississippi and the Mobile & Ohio.

The Interstate Commerce Commission has suspended from October 11 until February 8, 1917, proposed increases in rates on logs in carloads from points on the Chicago, Memphis & Gulf and the Illinois Central, in Kentucky, Tennessee, Alabama and Mississippi, to New Albany, Ind.; Louisville, Ky., and certain other Ohio river crossings. The proposed rates are from ½ to 2 cents per 100 lb. higher than those now in effect.

The commission has suspended from October 7 until February 4, 1917, the operation of items in tariffs filed by F. A. Leland and Eugene Morris providing for the cancellation of a proportional commodity rate of 68½ cents per 100 lb. on fresh meats in carloads from St. Louis, Mo., to Fort Worth, Texas, applicable on shipments originating at New York, Jersey City and Newark. The proposed rate from St. Louis to Fort Worth is 89.3 cents.

STATE COMMISSIONS

The Public Service Commission of Alabama has refused to continue beyond October 13, the limit originally fixed, the increased freight rates authorized by the commission two years ago on a large number of important commodities. The roads interested are the Central of Georgia, the Western of Alabama, the Seaboard Air Line and the Atlanta, Birmingham & Atlantic. These rates, because of the high cost of railway operation, were allowed by the Commission to be advanced 10 per cent. The carriers had applied for an indefinite continuation of the higher rates.

The Missouri Grain Dealers' Association has asked the Missouri Public Service Commission to revise grain rates in Missouri, alleging that intrastate rates are not uniform north and south of the Missouri river. For the purpose of equalizing markets there is a proportional rate of nine cents per 100 lb. on wheat; for example, from Omaha, Nebr., or Kansas City, Mo., to all Mississippi river crossings. This results in a maximum local rate of 13 cents per 100 lb., from Omaha or Kansas City to St. Louis, which may be applied as a maximum from directly intermediate points. As a result the maximum rate of 13 cents may be applied from the northwest corner of the state; for example, Tarkio, to St. Louis, and at the same time from Pleasant Hill to St. Louis, a considerably shorter distance. Likewise lines north of the Missouri have a maximum of 11¾ cents per 100 lb. on wheat from such points as Plattsburg and Lathrop to St. Louis, whereas somewhat higher rates obtain for corresponding distances south of the Missouri river. The Commission has

deferred consideration of the complaint to await the outcome of an injunction suit brought against it in the Missouri Supreme Court, seeking to deny the Commission the right to increase any rates fixed by statute. Some months ago the Commission undertook, after a hearing, to increase certain commodity rates which had been fixed by statute, among which were included rates on grain.

COURT NEWS

Abolition of Fellow Servant Defense

Action was brought under the North Dakota act of 1907, taking away from railroads the defense of negligence of fellow servant, for injuries to an employee through the carelessness of a fellow servant in allowing a feed grinder to fall on him while unloading freight. The North Dakota Supreme Court held that the unloading of freight trains is work which is directly connected with the operation of the road, and belongs to the class which may be termed railroad work proper; that the statute was not unlawfully discriminative; and that it applied to the plaintiff's case.—Gunn v. St. Paul (N. Dak.), 158 N. W., 1,004.

Alabama Anti-Shipping Law

The Alabama Supreme Court, in an action to compel a railroad to transport certain liquors within the state, tendered by officers who had seized it under warrant, holds that the state anti-shipping law, in connection with the prohibition laws, has no application to intrastate shipments of liquors seized under legal process and their transportation in response to court process. Under this law it is incumbent on the officer having possession of such liquor, in order to put a railroad in default for not receiving it for shipment, to show his authority under legal process, as by presenting a written order from the proper court, and not by a mere statement or his writing on the package.—Central of Georgia v. State (Ala.), 72 So., 555.

Look and Listen Rule—Private Crossings

In an action for the death of a boy of 13, who was riding in a wagon driven by another, the boy's father's hired man, and was killed at a private crossing, the Nebraska Supreme Court holds that the act of a person in going on a crossing, without first listening and looking, in the absence of a reasonable excuse therefor, is such as permits of no other inference than that of negligence; and if such failure to look and listen contributes to the party's injury he cannot recover. Where two persons of equal authority are riding in a vehicle, which is driven upon a railroad track in front of an approaching train in full, unobstructed view, it is immaterial which is driving, since, if either party looked and listened, he must have seen the train approaching.

A railroad company may run its trains whenever necessary in the conduct of its business, and travelers at a private crossing are guilty of negligence if they assume to know when the trains will be run, and so fail to look and listen before crossing. Judgment for the plaintiff was reversed.—Johnson v. Delano (Neb.), 158 N. W., 1,034.

Fellow-Servant or Passenger?

A switch and signal company, installing electric signals for a railroad, was transporting one of its servants, whose employment was cleaning out battery wells, on a gasolene rail car, to and from a boarding house operated by it, when he was injured through his gang foreman throwing on the brakes too sharply. In an action against the company the South Dakota Supreme Court held, by a divided court, that the plaintiff was a passenger, and was not injured by the negligence of a fellow servant, and so could recover. Whiting, J., dissenting, said: "Under the contract it was his duty to ride on this car to and from work, morning and evening, and to and from the place for meals at the noon hour. The transportation was not 'furnished as a matter of convenience to appellant, but as a necessary and essential element in the carrying out of the enterprise in which appellant and his fellow workmen were engaged."—Williams v. Union Switch & Signal Company (South Dakota), 158 N. W., 901.

Alighting from Train—Unforeseen Accident

In an action for personal injuries to a passenger the railroad offered evidence that the train stopped a few hundred feet from the station for an intersecting train, and that the conductor told all passengers to keep their seats unless they were changing to the other train. He put down the step and assisted passengers to alight, and waited ten minutes for any passengers who wished to alight. He then removed the step and went up to talk to the engineer. The plaintiff then tried to alight and fell. The Texas Court of Civil Appeals held that the railroad was entitled to have submitted to the jury the special issue whether a very prudent person under the circumstances would have foreseen the plaintiff's act and her injury, since, if employees, exercising the highest degree of care, could not have foreseen the result, the road was not liable.—Texas Central v. Driver (Tex.), 187 S. W., 981.

Excessive Taxation of Insolvent Road

Although a railroad company, by failing to take the steps prescribed by statute, has lost the right to question the validity of tax levies against its property, where its affairs are being administered by a federal court of equity through a receiver, that court has power to determine the validity of the claim for taxes, and if it appears that they were so erroneous in the methods of assessment, imposition or computation as to be fraudulent, to direct that only the proper amount shall be paid from the estate. The taxes levied upon the property and franchise of the Babylon, whose estate was being administered in equity, were held by the federal district court, E. D., New York, to be so excessive, as compared with those levied on similar property of other companies, that their allowance in full would operate as a fraud on other creditors, and to require the court to reduce the same to a just amount.—Spencer v. Babylon, 233 Fed., 803.

Right to Build Third Track

The New York Supreme Court, Special Term, Erie County, holds that when a railroad with two tracks granted other roads the right to cross, the grant did not carry with it the right permanently to compel the railroad to maintain its then manner of conducting its business at the crossing point, over two tracks only, so that its building a third track might be enjoined.

Where a double-track railroad has been in operation for more than 50 years, since 1891 being intersected by another double-track road, the laying of a third track for switching and other purposes, by the side and but a few feet from the westerly of the two tracks upon the first road's right of way, does not make such third track a "new railroad," within Railroad Law (Consol. Laws, c. 49) § 22, relating to intersections of roads, or a "steam railroad hereafter constructed," within section 98; the term "railroad," as used in the statute, meaning the tracks on a single right of way.—Buffalo Creek v. N. Y. C., 160 N. Y. Supp., 546.

Frog Blocking Statute Construed

The Arkansas Supreme Court holds that the statute of 1911, requiring railroads to block frogs, being a penal statute, must be construed strictly. A prosecution was filed on August 10 for failure to block a frog in a certain county on August 2, and on August 11 another was filed in the same county for failure to block another frog on August 3. The railroad contended that but one penalty could be recovered for a violation of the act in each county. On the other hand it was contended by the state that the railroad should be liable for a penalty if it failed to comply with the act at every station and every frog at every station. It was held that the failure to maintain blocks at any and all of the road's frogs constitutes but one offense. A separate penalty does not accrue for the failure to place and maintain blocks at each of its frogs. If the railroad has 12 frogs in any one county and fails to block all of them, this constitutes but one offense. If it fails to block one of them, this still constitutes one offense. Only one penalty can be collected in one county to the date of beginning the prosecution, regardless of the number of frogs left unblocked. But if, after the commencement of the prosecution, the statute is again violated, another penalty may be recovered in another prosecution commenced thereafter, and so on as long as violations continue.—St. Louis, I. M. & S. (Ark.), 187 S. W., 1,064.

Railway Officers

Executive, Financial, Legal and Accounting

A. J. Biard, acting auditor of the Texas & Pacific at Dallas, has been appointed auditor.

J. A. Sandberg, auditor of disbursements for the Great Northern, has been appointed auditor of joint facility accounts, a newly created position.

J. H. Boyd, assistant auditor of disbursements for the Great Northern, has been appointed auditor of disbursements, having headquarters as at present at St. Paul, Minn.

F. H. Hill has been appointed auditor of the Kinston Carolina Railroad & Lumber Company, with headquarters at Norfolk, Va., succeeding T. Gibson Broughton, resigned to enter another line of business.

George H. Earl, secretary and assistant treasurer of the Northern Pacific, with office at New York, has been elected third vice-president, and E. A. Gay, assistant secretary at New York, has been elected secretary and assistant treasurer.

Operating

E. M. Cooper has been appointed assistant superintendent of the St. Louis-Southwestern, succeeding F. S. Stimson.

R. F. Beaudry, trainmaster of the Elgin, Joliet & Eastern, at Joliet, Ill., has been appointed superintendent of the Joliet division, with same headquarters.

R. J. Harlan has been appointed general manager of the Louisville & Wadley, with office at Wadley, Ga., in place of T. T. Holloman, general superintendent, resigned.

H. C. Holmes has been appointed superintendent of the Guantanamo & Western, with office at Guantanamo, Cuba, vice H. H. McGinty, resigned to accept service elsewhere.

John M. Condon, special agent of the Erie at Youngstown, Ohio, has been appointed trainmaster of the Kent division, with office at Marion, Ohio, relieving Frank Eberhart, transferred.

Carl Bucholtz, trainmaster of the Marion division of the Erie at Huntington, Ind., has been appointed assistant superintendent of the Kent division, with office at Kent, Ohio, relieving P. O'Neill, assigned to other duties.

J. E. Reilly has been appointed trainmaster of the Joliet division of the Elgin, Joliet & Eastern, except the Joliet terminals, with office at Joliet, Ill. He succeeded R. F. Beaudry, promoted. W. H. Conine has been appointed assistant trainmaster, with same headquarters.

William Wilson, trainmaster of the Southern Pacific at Yuma, Ariz., has been appointed assistant superintendent of the Portland division, with office at Portland, Ore., assuming part of the duties heretofore devolving upon C. W. Martyn, assistant superintendent, with the same headquarters. Both of these officials will report to F. L. Burckhalter, division superintendent.

W. H. O'Keefe, whose appointment as assistant general superintendent of the Michigan Central, with office at Detroit, Mich., has already been announced in these columns, began railway work in 1880 with the Michigan Central, and has been continuously in the employ of this one company since. In 1883 he was made trainmaster's clerk, and from this time up to 1913, when he was appointed superintendent of terminals at Detroit, Mich., he passed consecutively through the grades of clerk, chief clerk to the superintendent, assistant yardmaster, yardmaster, general yardmaster, assistant trainmaster, trainmaster, assistant superintendent and superintendent. His present appointment as assistant general superintendent became effective on October 1, 1916.

Traffic

W. T. Walsh has been appointed general agent of the Ft. Smith & Western, with office at Atlanta, Ga., in place of T. C. Tipton, resigned.

S. B. Murray has been appointed commercial agent of the Seaboard Air Line, with office at Birmingham, Ala., vice S. K. Hawkins, resigned.

L. W. Hazelhurst, assistant commercial agent of the Illinois Central at Chicago, Ill., has been appointed commercial agent, with office at Memphis, Tenn.

John D. Marney, division freight agent of the Baltimore & Ohio Southwestern at Springfield, Ill., has been appointed division freight agent at Louisville, Ky.

E. S. Vincent, commercial agent of the Texas & Pacific, with office at Little Rock, Ark., has been appointed commercial agent, with office at Shreveport, La., succeeding T. J. Keen, transferred.

T. J. Keen, commercial agent of the Texas & Pacific, at Shreveport, La., has been appointed commercial agent with office at Little Rock, Ark., succeeding E. S. Vincent, assigned to other duties.

J. V. McCullough, commercial agent of the Seaboard Air Line at St. Petersburg, Fla., has been appointed commercial agent, with office at Miami; and S. J. Corey is appointed commercial agent at St. Petersburg, Fla., succeeding Mr. McCullough. Mr. Corey will have jurisdiction over all matters pertaining to passenger and freight solicitation at points on the Tampa & Gulf Coast.

C. W. Tomlinson, general eastern freight agent of the Baltimore & Ohio at New York, has been appointed to the newly created position of general traveling freight agent, with headquarters at Cincinnati, Ohio; Stuart Allen, manager of the Continental Line and the Central States Dispatch, Cincinnati, fast freight connections of the Baltimore & Ohio, succeeds Mr. Tomlinson as general eastern freight agent at New York; T. J. Walters, division freight agent of the Baltimore & Ohio at Pittsburgh, Pa., has been promoted to manager of the Continental Line and the Central States Dispatch, and J. C. Kimes, commercial freight agent of the Baltimore & Ohio at Pittsburgh, succeeds Mr. Walters as division freight agent.

O. P. McCarty, passenger traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., whose authority was extended recently over all owned, leased or controlled lines, as has already been announced in these columns, was born at Massillon, Ohio, and began railway work on June 1, 1864. He served until 1866 as a clerk in the general ticket office of the Cincinnati & Chicago Air Line, and from May to July, 1866, was city ticket agent of the Chicago & Great Eastern. He then went with the Columbus & Indianapolis Central, and later entered the service of the Pittsburgh, Cincinnati & St. Louis. The next 10 years he spent as chief clerk in the general ticket office of the Indianapolis, Bloomington & Western, and from January to April, 1880, was division clerk in the general ticket office of the Union Pacific. He was then, to May, 1881, chief clerk in the ticket department, and later served until August, 1887, as assistant general ticket agent of the same road. From November, 1887, to May, 1888, he was chief rate clerk of the Trunk Line Passenger Committee at New York, and then, to August of the following year, was chief clerk in the general passenger office of the Baltimore & Ohio. He subsequently served as assistant general passenger agent of the same road until March, 1890, then as general passenger agent of the Baltimore & Ohio Southwestern Railroad until November, 1893. From October, 1889, to July, 1890, he was also general passenger agent of the Columbus, Cincinnati & Midland, now part of the Baltimore & Ohio. From May 1, to November 1, 1893, he also served as acting general

O. P. McCarty

passenger agent of the Ohio & Mississippi. From November, 1893 to September, 1894, he was general passenger agent of the Baltimore & Ohio Southwestern Railway, which was formed by a consolidation of the Baltimore & Ohio Southwestern Railroad and the Ohio & Mississippi. From October, 1894, to December, 1896, he was general traveling passenger agent of the Southern Pacific; then to September of the following year was assistant general passenger agent of the same road at New Orleans, La. In October, 1897, he returned to the service of the Baltimore & Ohio Southwestern, as general passenger agent, remaining in that position until September, 1911. From March, 1911, to the following September he was also general passenger agent of the Cincinnati, Hamilton & Dayton, and on September 1, 1911, was appointed passenger traffic manager of the Baltimore & Ohio.

Engineering and Rolling Stock

F. B. Rosencrans has been appointed signal inspector of the Great Northern with headquarters at St. Paul, Minn.

A. H. Kendall has been appointed master mechanic of the Canadian Pacific, with office at Toronto, Ont., in place of W. J. Pickrell, transferred.

J. D. Elder has been appointed division engineer of the west division of the Michigan Central, with office at Niles, Mich., vice C. C. Hill, transferred to the valuation department. E. C. Wurzer has been appointed division engineer of the Detroit division, with office at Detroit, Mich., and John Evans, division engineer at Detroit, has been appointed division engineer of Detroit terminal and Toledo division, with office at Detroit.

William Kelly, general master mechanic of the Great Northern at Spokane, Wash., has been appointed assistant superintendent of motive power, with headquarters at Spokane, with jurisdiction over the Central and Western districts. M. J. Flanigan, who was recently appointed master mechanic of the Minot division, with office at Minot, S. Dak., has been appointed general master mechanic, with headquarters at Great Falls, Mont., vice F. M. Fryburg, who has been appointed master mechanic of the Butte division, with headquarters at Great Falls, Mont., vice J. C. Benson, who becomes master mechanic of the Montana division, with headquarters at Havre, Mont., vice R. R. Schule, assigned to other duties. N. C. Bettenburg has been appointed master mechanic of the Minot division, with headquarters at Minot, N. D., vice Mr. Flanigan, and J. J. Dowling is now master mechanic of the Cascade division, with headquarters at Delta, Wash.

OBITUARY

William Bross Jansen, formerly vice-president and assistant to president of the Atchison, Topeka & Santa Fe, died on October 7, at Chicago, Ill. He was born on November 22, 1868, at Chicago and on September 15, 1886, began railway work. He served consecutively as chief clerk in the yard of the Atchison, Topeka & Santa Fe, at Topeka, Kan.; ticket collector on passenger trains; clerk in the general manager's office; private secretary to general manager, and then as chief clerk in the general manager's office, until April, 1897, when he was appointed secretary to president. From June, 1901, to September, 1910, he was assistant to president, and from January, 1906, to September, 1909, also fourth vice-president; from September, 1909, to September, 1910, vice-president and assistant to president. His entire railway service had been with the Atchison, Topeka & Santa Fe system.

William McWood, formerly superintendent of the car department of the Grand Trunk, from which position he retired on a pension in 1908, died on October 4, after a long illness. He was born in 1830 at Montreal, Quebec, and served an apprenticeship with John Thorton, coach builder. He entered the services of the Grand Trunk in 1855, and from 1860 to 1873 was foreman on the same road. He then served as assistant mechanical superintendent, and superintendent of the car department of the same road, in charge of the car department of the entire line from 1873 until his retirement on January 1, 1908, after a continuous service of 53 years with the Grand Trunk. Mr. McWood took a very active part in the organization of the Master Car Builders' Association, having been a member of that association since 1875. From 1882 to 1887 he served as vice-president, and for the three years 1888, 1889 and 1890 as president of the same association.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO & NORTH WESTERN is inquiring for 25 Mikado, 25 switching, 15 transfer switching and 12 Pacific locomotives.

THE LONG ISLAND has ordered 6 superheater ten-wheel locomotives from the American Locomotive Company. These locomotives will have 21 by 26 in. cylinders, 60½ in. driving wheels, and a total weight in working order of 178,000 lb.

THE ATLANTA, BIRMINGHAM & ATLANTIC has ordered 3 superheater Santa Fe type locomotives from the Baldwin Locomotive Works. These locomotives will have 27 by 30 in. cylinders, 57-in. driving wheels, and a total weight in working order of 314,000 lb.

THE CHESAPEAKE & OHIO, reported in last week's issue as contemplating the purchase of 25 Mallet type locomotives, has ordered 25 superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 22 and 35 by 32 in. cylinders, 56 in. driving wheels, and a total weight in working order of 435,000 lb.

THE WHEELING & LAKE ERIE, reported in last week's issue as inquiring for 15 Mallet type locomotives, has ordered 10 superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 25½ and 39 by 32 in. cylinders, 63 in. driving wheels, and a total weight in working order of 435,000 lb.

FREIGHT CARS

THE WESTERN PACIFIC is building 100 stock cars.

THE BIRMINGHAM SOUTHERN is in the market for 50 coke, 25 flat and 15 box cars.

THE DETROIT, TOLEDO & IRONTON is in the market for 100 to 200 automobile box cars.

THE BRIER HILL STEEL COMPANY, Youngstown, O., is in the market for 30 coke cars.

THE COLD BLAST TRANSPORTATION COMPANY is inquiring for a number of refrigerator cars.

THE MILWAUKEE COAL & GAS COMPANY has ordered 300 gondola cars from the American Car & Foundry Company.

THE ISLAND PETROLEUM COMPANY, Pittsburgh, Pa., has ordered 10 tank cars from the Pressed Steel Car Company.

THE WHEELING & LAKE ERIE has ordered 500 gondola cars from the Pressed Steel Car Company and 500 from the Standard Steel Car Company.

THE MARCEL TANK LINE has ordered 60 40-ton, 8,000 gal. tank cars and 40 50-ton, 10,000 gal. tank cars from the American Car & Foundry Company.

THE CHICAGO & NORTH WESTERN, reported in last week's issue as inquiring for 500 50-ton steel ore cars, has also issued inquiries for 1,700 50-ton composite gondola cars and 1,000 30-ton wooden box cars.

THE CHICAGO & ALTON, reported in the *Railway Age Gazette* of September 22 as inquiring for 200 automobile cars, has ordered these cars from the Haskell & Barker Car Company. These are in addition to 150 automobile cars also being built by the same company.

PASSENGER CARS

THE BALTIMORE & OHIO is reported in the market for possibly 100 passenger train cars.

THE NEW YORK CENTRAL has issued inquiries for 25 or more 60 ft. 6 in. baggage cars, and 50 or more 70 ft. coaches, and is building 4 dining cars in its own shops.

THE LONG ISLAND, reported in the *Railway Age Gazette* of September 8 as inquiring for 60 coaches and 10 baggage cars, is reported to have ordered a number of cars from the Pressed Steel Car Company.

Supply Trade News

The Westinghouse Air Brake Company on October 6 declared a special dividend of $5 a share, or 10 per cent.

Stanley H. Smith, of the sales staff of the Bethlehem Steel Company, at Chicago, Ill., has been appointed sales agent of the Cleveland district, with office at Cleveland, Ohio.

The unfilled orders of the United States Steel Corporation on September 30 totaled 9,522,584 tons, as compared with 9,660,357 tons on August 31, or 5,317,618 tons on September 30, 1915.

At a meeting of the board of directors of the Hess-Bright Manufacturing Company, Philadelphia, Pa., on October 6, B. D. Gray was elected president succeeding F. E. Bright who is now chairman of the board.

The Western Electric Company is now employing 23,000 persons, the largest number in its history. It is expected that the company's gross sales this year will total over $100,000,000 as compared with $77,000,000 last year.

The Union Switch & Signal Company announces the following appointments: M. L. Gray, assistant to general sales manager; H. A. Wallace, signal engineer; H. S. Loomis, commercial engineer, all with office at Swissvale, Pa.

The H. W. Johns-Manville Company, New York, has opened a new branch office at Great Falls, Mont. The office is at room 418, Ford building, and is in charge of J. H. Roe. With the opening of the Great Falls office the H. W. Johns-Manville Company increases the number of its branches to 55.

Articles of incorporation have been filed in Delaware for the Inter-Continental Machinery Corporation with a nominal authorized capital stock of $500,000. It is understood that the new enterprise will deal in machinery in general, but specialize in machine tools both in the United States and foreign countries. The organization is headed by Charles N. Thorn, until recently vice-president of the Allied Machinery Company of America, which is now part of the American International Corporation. Mr. Thorn had been connected with Manning, Maxwell & Moore for 14 years. The other officers consist of Joseph S. Clark, of E. W. Clark & Co., Philadelphia; R. E. Robinson, of R. E. Robinson & Co., bankers, New York, and Chester B. Overbaugh, formerly manager of the Thompson-Starrett Company, Washington, D. C., vice-presidents, and Arthur M. Watkins, secretary. The company will establish branch offices in the principal countries of Europe, beginning with Russia, in which country the company will establish its branch in Petrograd, following with Moscow, Odessa and Vladivostok. An office and salesroom at Paris, France, and also one in London, will follow rapidly. It is also planned to open offices in China and Japan.

Westinghouse Air Brake Company

A statement to the stockholders of the Westinghouse Air Brake Company, issued by President H. H. Westinghouse, says in part:

The net profit for the year, after the usual scheduled monthly charges against production to cover depreciation, also charges to cover workmen's compensation fund and pension fund requirements, totals $9,396,103, as compared with $1,575,838 for the previous year. This result is due to a recovery in the company's brake business to a point somewhat in excess of its normal level, as determined by the five-year average, and to the satisfactory conclusion of our contract for 1,250,000 18-lb. shrapnel. It is gratifying to state that the estimates made by the management on undertaking this business have been confirmed, not only with respect to the profit resulting therefrom, but as to its beneficial effect on the community at large. The shop pay rolls of the year under review aggregated $4,713,377 as compared with $2,048,245 for the previous year, while in addition to this increase of $2,665,132 in wages paid directly to employees of the Westinghouse Air Brake Company, a very large amount was disbursed among workmen in other plants which furnished material purchased by the Brake company to meet the requirements of its munition contracts.

In connection with these contracts an ample reserve has been set up to cover the munition tax on deliveries made during the calendar year 1916, by which the United States Government will ultimately become a beneficiary of this branch of our business provided an excise tax levied subsequently to the sale of the product taxed is found to be constitutional.

Your company is now engaged in executing a contract for 1,100,000 time fuses, which will be completed during the current calendar year. No additional business of this character is now in sight.

During the year the Westinghouse Brake Company, Ltd., of London, has paid dividends aggregating 12½ per cent and continues to do well. The Russian and Italian companies are likewise prosperous, the former having recently declared a dividend of 12 per cent out of the earnings of the year ended December 31, 1915. The French Brake Company is steadily increasing its resources, and its future prosperity seems to be assured. The current electrical business of the Canadian Westinghouse Company, Ltd., is exceptionally heavy and its net earnings this year will exceed those of 1915, out of which dividends aggregating 9 per cent were declared and paid.

The consolidated balance sheet follows:

ASSETS

Cash	$3,432,177
Accounts and bills receivable	6,079,744
Inventory at cost, including material, supplies, goods in progress and finished stores	7,908,194
Deferred charges to operation	84,655
Investments, including 22,974 shares Westinghouse Brake Co., Ltd., of London, par value £10 per share; 17,270 shares Canadian Westinghouse Co., Ltd., par value $100 per share, and sundry other investments	8,316,959
Factories, less Reserves for Depreciation	6,549,649
Real Estate, other than for factories	1,950,254
Patents and Goodwill	2,515,345
	$36,836,977

LIABILITIES

Accounts payable	$1,566,281
Advances on contracts	70,710
Accrued liabilities	745,134
Contingent liability on account of sales, subject to future settlements	289,636
Capital Stock	19,638,467
Sundry Reserves	2,691,450
Contingent surplus, excess par value capital stock of American Brake Company, over value on books of Westinghouse Air Brake Company	1,000,000
Surplus, applicable to dividends	10,835,299
	$36,836,977

A meeting of the stockholders has been called for October 19, at Wilmerding, Pa. Proposed changes in the by-laws, including the creation of the office of chairman of the board, will be voted on.

W. P. Barba Resigns from Midvale Steel Company

W. P. Barba, vice-president of the Midvale Steel Company, Worth Brothers Company and the Wilmington Steel Company, has resigned, and the duties of vice-president of these three companies will be assumed by E. E. Slick, vice-president of the Cambria Steel Company. Mr. Barba will take a few months' rest and travel before taking up some special work along the lines of his wide experience at Midvale; he does not intend to undertake the same character of work that he is now relinquishing. Mr. Barba had been in the employ of the Midvale Steel Company for 36 years. Entering Midvale in 1880 as a boy, in nine years he was made chief chemist, then department superintendent, and, not long after, general manager of sales. A few years ago he was made general superintendent, and upon the resignation of the general manager he was called upon to fill that position, which he held until he was made vice-president at the time of the taking over of the plant by the Corey interests.

TRADE PUBLICATIONS

BURNING CRUDE OIL.—A booklet recently issued by the De La Vergne Machine Company, New York, says that in the De La Vergne oil engine one cubic inch of oil has 6,000 sq. in. of surface all exposed to the high temperature oxygen at the same instant.

SIMPLEX JACKS.—Templeton, Kenly & Co., Ltd., Chicago, has issued a 32-page pamphlet illustrating and describing the simplex jack and its application to various industrial purposes. Of special interest to railway men is the application of these jacks to car repairs, the several designs of track jacks and the Simplex

Pole jack, designed for placing, straightening or pulling telephone, telegraph or power line poles.

MILLING MACHINES.—Catalogue No. 19, recently issued by the Kearney & Trecker Company, Milwaukee, Wis., is an 86-page booklet describing and illustrating the company's line of milling machines. The Kearney & Trecker Company manufactures milling machines only. In its catalogue it takes up point by point every part of the machines, emphasizing each detail of mechanical correctness and summarizing the advantages of its unique and patented features.

HORIZONTAL POWER PUMPS.—Bulletin No. 201 of the National Transit Pump & Machine Co., Oil City, Pa., is a 20-page pamphlet devoted to the company's line of horizontal piston power pumps, which are designed to cover a wide range of general service. The pumps are designed either for belt or direct connection to the prime mover and are furnished direct connected to National Transit gas and oil engines of the vertical type. The pamphlet is a complete catalogue, giving sizes and dimensions of the various types.

BUILDING CODE SUGGESTIONS—The National Lumber Manufacturers' Association has recently issued technical letters No. 4 and No. 5 under this title which contain many valuable suggestions for the safeguarding of frame and ordinary construction buildings against fire loss or damage. The papers are prepared primarily from the standpoint of the dwelling, but the information contained is applicable in the main to any buildings of wood construction or those having brick or masonry walls with wooden floors, roof, etc. Letter No. 4 contains information concerning various construction details, while No. 5 specializes on chimneys and smoke pipes.

FEED WATER TREATMENT.—One of the latest publications of the Dearborn Chemical Company, Chicago, bears the title, "Incrustation, Corrosion, Foaming and Other Effects of Water Used in Steam Making and Methods of Prevention." The booklet first emphasizes that the Dearborn Chemical Company does not supply a "cure-all," and that it is not a "boiler compound house." The book in three chapters takes up respectively the subjects of corrosion, including pitting, grooving and electrolysis; incrustation, including soft and hard scale of varying compositions; and foaming, including priming, bagging, causes of explosion, etc., with a discussion of oil in boilers. One section deals with the Dearborn Chemical Company itself, showing how its experts make analyses, work out formulas and compound the proper remedies. The book is well illustrated, several pictures showing parts of the office and plant.

TAPS AND DIES.—The Greenfield Tap & Die Corporation, Greenfield, Mass., has recently issued catalogue No. 37, containing the entire line of the Greenfield Tap & Die Corporation, and taking the place of the old divisional catalogues as follows: Wells Brothers Company, Division No. 34; Wiley & Russell Manufacturing Company, Division No. 36; A. J. Smart Manufacturing Company, Division No. 3. By combining the tools of the different divisions, the line has been much simplified. The famous old trade marks, "Little Giant," "Lightning," "Green River" and "Smart," are still retained as applies to taps, dies and screw plates, these brand names having reference particularly to the various styles of dies which have so long been marketed under these names. The new G. T. D. trade mark is already making its appearance on some of the tools of the corporation, and will be added to others as fast as practicable. The line illustrated in the new catalogue includes taps, dies, screw plates, reamers, gages, threading machines, tap and die holders, the friction tap chuck, the Wells self-opening die, the new "Gun" tap, pipe threading tools, etc.

CANADA'S WIRE NAILS AND CAST-IRON PIPE.—Canada's production of wire nails in 1915 is estimated at 1,636,000 kegs of 100 pounds, as compared with 1,144,000 kegs in 1914. The output of cast-iron pipe amounted to 53,700 net tons, as compared with 93,200 tons in 1914.

ELECTRIFICATION OF NORWEGIAN RAILWAYS.—A beginning is soon to be made for the electrification of the State railways of Norway. The railway committee of the Storthing recently approved the proposal for the electrification of the line running from Christiania to Drammen, the estimated cost of which will be $6,520,000.

Railway Construction

CANADIAN PACIFIC.—The Stirling subdivision of the Alberta division has been extended from Foremost, Alta., east to Pakowki, 22.2 miles.

GUELPH JUNCTION RAILWAY.—See Guelph Radial.

GUELPH RADIAL RAILWAY.—Plans are under consideration for building under the name of the Guelph Junction Railway a branch line from Linwood, Ont., south to Wellesley, about 9 miles. J. W. Lyon, president, Guelph.

MCDONALD & BURGETTSTOWN (ELECTRIC).—Incorporated in Pennsylvania with $100,000 capital, it is said, to build a 15-mile electric line in Washington county. R. L. Henderson, Pittsburgh, Pa., may be addressed.

MITCHELL & NORTHWESTERN.—The Railroad Commissioners of South Dakota have granted a permit to this company to build the proposed line from Mitchell, S. Dak, northwest to Highmore about 100 miles. (Sept. 8, p. 434.)

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has let to the Thomas J. Buckley Construction Company, the lowest bidder, at $372,893, the contract for the construction of the Two Hundred and Thirty-ninth street railroad yard for the storage of subway cars. (October 6, p. 620.)

The commission will open bids on October 19 for the construction of concrete track floors and platforms over the mezzanine of eleven stations on the Culver Rapid Transit road in the borough of Brooklyn.

PHILADELPHIA ROADS.—Bids are wanted until November 2 by William S. Twining, director, department of city transit, Philadelphia, Pa., for the construction of a section of the Broad street subway, comprising a portion of the station under City Hall, and the Market street subway, and work appurtenant thereto, known as Contract 102. This section will be about 300 ft. long and 106 ft. wide, embracing four tracks with two station platforms, and will include the underpinning of the west side of City Hall, and also the Market street subway.

PITTSBURGH & LAKE ERIE.—This company is planning to build an extension, it is said, from a point near Connellsville, Pa., west to Darnley, about six miles.

ROACH TIMBER COMPANY (Lumber Road).—This concern is constructing a line from Sutherlin, Ore., on the Southern Pacific to Hinkle creek, and thence seven miles into the forest, a total distance of 21 miles. About five miles of grading has already been finished. The excavation is averaging 7,000 cu. yd. to the mile; the maximum grade is about 1 per cent and the maximum curve 15 deg. It is the plan of the company to finish the line to the sawmill sites during the coming winter. All the work is being done by the company's own forces. W. L. Roach, of Muscatine, Iowa, is president.

ST. LOUIS & SOUTHERN ILLINOIS (ELECTRIC).—Work will commence on a new interurban system, as named above, on or about November 1 of this year. The line will run from Marion through Harrisburg, Herrin, Benton and West Frankfort to Johnson City, a distance of 81 miles. These towns are all located in Southern Illinois, in Williamson, Saline and Franklin counties, the average population being about 5,000. This project has been under consideration for several years, but has been delayed until now. It is estimated that it will cost $3,000,000.

SAN ANTONIO & AUSTIN INTERURBAN.—This company, which has been working on the project to build an interurban electric railway between San Antonio, Texas, and Austin, 82 miles, for the last three years, expects to begin work on the line in a short time, it is announced by Vorhis P. Brown, of San Antonio, president of the company. In addition it is announced that a branch line will be built from Austin to Lockhart, 30 miles. (June 2, p. 1205.)

TENNESSEE RAILWAY.—This road has been extended from Charleys Branch, Tenn., to Rosedale, two miles. (September 17, 1915, p. 547.)

VIRGINIAN RAILWAY.—According to press reports this com-

pany is planning to build an extension in Raleigh county, W. Va., of 7 miles and another extension of 9 miles.

WEST VIRGINIA TRACTION & ELECTRIC COMPANY.—According to press reports this company contemplates building an extension in West Virginia. This company now operates a line from Morgantown to Sabraton.

RAILWAY STRUCTURES

ASHEBORO, N. C.—Bids were opened recently by the Norfolk Southern for the construction of a combined passenger and freight station to be built on Depot street, at Asheboro. The proposed structure will be 30 ft. wide and 124 ft. long. It will have concrete foundations, brick walls and a metal or asbestos shingle roof (June 9, p. 1246).

BELMONT, N. C.—Contracts have been let by the Southern Railway for the construction of a new concrete and steel bridge across the Catawba river, near Belmont, to take the place of the temporary structure, erected after the destruction of the old bridge by the flood in July. Contract for the steel work has been awarded to the Virginia Bridge & Iron Company, Roanoke, Va., and contract for the masonry and for line revision 4,800 feet east of the new bridge, and 3,300 feet west, has been let to Robert Russell. The new bridge will be located about 40 feet north of the site of the old bridge; it will be 900 ft. long, and will be 11 ft. higher than the old bridge. It will consist of 9 100-ft. deck plate girders, each weighing 170,000 pounds, and will be supported by concrete piers. The piers will be built for double track, but girders for only one track will be put in at the present time. (September 1, 1916, p. 391.)

BLAIRSVILLE, PA.—A contract has been let to G. C. Overdorf, Blairsville, for work on a 20-ft. two-track concrete arch bridge. It is to be built over Robinson run, at a point 16 miles west of Blairsville, and will cost about $10,000.

BOSTON, MASS.—The New York, New Haven & Hartford has given a contract to H. L. Hemenway, Boston, for building an extension to the present engine house and constructing a new shop building at Dover street, Boston. The extension will consist of 14 stalls to the engine house, and the new shop building will be about 60 ft. by 200 ft., one story high, with hollow tile walls and concrete foundations.

EDMONTON, ALTA.—The Canadian Northern is erecting a warehouse at this point. The building is to be 86 ft. long, 48 ft. wide, 27 ft. high from base of rail to the eaves, and two stories high. It will have concrete foundations and brick walls. The approximate cost is $90,000.

MADISON, N. C.—The Norfolk & Western, it is said, will build a station, also a platform and shed, at Madison.

MANCHESTER, N. Y.—Work was begun recently by the Lehigh Valley on the construction of a large engine terminal and roundhouse at Manchester (June 16, p. 1353).

MONTREAL, QUE.—Bids will be asked for about November 1, it is said, for work on the Lagauchetiere street station of the Canadian Northern.

RIDEAU JUNCTION, ONT.—The Canadian Northern Ontario has awarded a contract to the Roberts & Schaefer Company, of Chicago, Ill., for the rebuilding of the frame-constructed automatic coaling plant at this point, which was recently destroyed by fire.

RUTHERFORD, PA.—The Philadelphia & Reading has given a contract to the James McGraw Company, Philadelphia, Pa., for the concrete foundation work in connection with bridge improvements, consisting of an extension for additional track, to be made to the bridge over Lebanon and Harrisburg turnpike at a point west of Rutherford. Contracts have not yet been let for the steel superstructure.

WASHINGTON, D. C.—The Southern Railway has given a general contract to James L. Marshall, Washington, D. C., it is understood, to build a new office building at Thirteenth street and Pennsylvania avenue, Washington, and construction work is now under way. The building will be 120 ft. by 90 ft., nine stories high, of fireproof construction, with steel frame, slag roof, tile floor arches, and will cost about $400,000 for the building alone. The construction work is expected to be completed by April 1, 1917.

Railway Financial News

BOSTON & MAINE.—Richard Billings, of Woodstock, Vt., has been elected president of the Connecticut River Railroad at the meeting of the new board of directors, succeeding William H. McClintock. A committee has been named to confer with the Boston & Maine, consisting of Mr. Billings; Henry B. Binney, of Brown Brothers, Boston office; William H. Brooks; Francis R. Hart, of the Old Colony Trust Company, Boston; and Mr. McClintock.

CONNECTICUT RIVER RAILROAD.—See Boston & Maine.

NEW YORK, NEW HAVEN & HARTFORD.—Stockholders are to vote on October 25 on the question of authorizing $700,000 5 per cent debenture bonds, the proceeds of the sale of which are to be used to pay for the proposed new passenger station at New Haven, Conn.

PERE MARQUETTE.—The following committee has been formed to protect the interests of the holders of the outstanding $5,000,000 Flint & Pere Marquette first mortgage 6 and 4 per cent bonds due 1920. E. H. Ladd, Jr., of Ladd & Wood; George E. Ide, president of the Home Life Insurance Company; John M. Holcombe, president of the Phoenix Mutual Life Insurance Company; Frederick H. Shipman, treasurer of the New York Life Insurance Company; and George S. Coe, of A. M. Kidder & Co., all of New York.

SOUTHERN RAILWAY.—The Wall Street Journal says that at this month's meeting of the Southern Railway directors it is expected that a plan will be considered for releasing the company from the restriction in its development and general mortgage which limits the rate of interest on bonds issued thereunder to 4 per cent To secure the consent of holders of the outstanding development and general mortgage 4 per cent bonds it is likely that they will be offered an increase in the rate on their bonds to probably 4½ per cent, and the mortgage would be changed so that additional bonds could be issued bearing 5 per cent interest. The Southern Railway has $5,000,000 5½ per cent extended notes due February 1, 1917, and $10,000,000 5 per cent notes due March 2, 1917.

A resolution was adopted at the annual meeting of stockholders approving the withholding of dividends on the preferred stock for the present.

TOLEDO & OHIO CENTRAL.—The New York Supreme Court has held that this company must carry out the terms of its guarantee of $3,500,000 first mortgage 5 per cent bonds of the Kanawha & Hocking Coal & Coke Company which have been defaulted.

EAST INDIAN RAILWAY.—The total length of the East Indian Railway proper is 2,448.22 miles, of which .85 of a mile is 6 track, 3.58 miles are 4 track, 24.21 miles 3 track, 610.72 miles double track, and 1,808.86 miles single track. In addition the Delhi-Umballa-Kalka Railway, 191.64 miles, and the South Behar Railway, 79.19 miles, were operated by the company, making the total length operated on March 31, 1916, 2,719.05 miles. The mean length operated (including foreign lines, 54.16 miles) during the half-year was 2,772.71 miles.

RAILWAY FIRE PROTECTION IN CANADA.—The work of preventing fires in Canada has been under the control of the board of railway commissioners for the past four seasons. Federal, provincial and railway officials have co-operated with good results. Conservation, a Dominion publication, gives details of the work. There were 686 forest fires which originated within 300 feet of the railway lines under the board's control. The area burned was 37,263 acres, 33.1 per cent being chargeable to the railways, 20.9 to other known causes, and the remainder undetermined. The estimated damage was $74,256, of which only 11.2 per cent is chargeable to the railways. Of all forest fires on property under the board's control, causes assigned are: Locomotives, 33.9 per cent; railway employees, 9.5 per cent; tramps, etc., 11.4 per cent; settlers, 12.5 per cent.

[ADVERTISEMENT.]

ANNUAL REPORTS

ILLINOIS CENTRAL RAILROAD COMPANY—SIXTY-SIXTH ANNUAL REPORT

To the Stockholders of the Illinois Central Railroad Company:

The following report of the operations and affairs of your Company for the year ended June 30, 1916, is respectfully submitted by the Board of Directors:

The number of miles operated on June 30, 1915, was.....4,767.14
On June 1, 1916, there was a reduction in the mileage due to putting in crossover at Aberdeen Junction, Miss., and a consequent reclassification of a portion of the former main track as sidetrack, of 21
The number of miles in operation on June 30, 1916, was.....4,766.93
The average miles of road operated during the year were.....4,767.12

INCOME

The income account for the year as stated below is compiled in accordance with the Interstate Commerce Commission's classifications and, for comparative purposes, the account for the preceding year is restated:

	1916	1915	INCREASE + DECREASE—
Average miles operated during year	4,767.12	4,770.03 —	2.91
Railway operating revenues:			
Freight (including bridge tolls and miscellaneous freight)	$ 50,045,039.44	$ 44,446,221.85 +	$5,598,817.59
Passenger (including bridge tolls and miscellaneous passenger)	13,582,091.99	12,851,677.38 +	730,414.61
Mail	1,146,298.72	1,050,706.59 +	95,592.13
Express	1,872,273.76	1,589,501.31 +	282,772.45
Other passenger train	480,885.99	457,177.96 +	23,708.03
Other transportation	906,517.68	766,286.52 +	140,231.16
Incidental and joint facility	1,044,234.98	949,980.64 +	94,254.34
Total railway operating revenues	69,077,342.56	62,111,552.25 +	6,965,790.31
Railway operating expenses:			
Maintenance of way and structures	9,506,526.60	8,866,250.34 +	640,276.26
Maintenance of equipment	16,547,749.43	13,943,804.48 +	2,603,944.95
Traffic	1,252,366.08	1,238,731.70 +	13,634.38
Transportation	21,841,049.72	22,217,902.68 —	376,852.96
Miscellaneous operations	375,222.27	355,991.97 +	19,230.30
General	1,763,356.06	1,655,794.46 +	107,561.60
Transportation for investment—Cr.	Cr. 112,542.42	Cr. 303,278.88 +	190,736.46
Total railway operating expenses	51,173,727.74	47,975,196.75 +	3,198,530.99
Net revenue from railway operations	17,903,614.82	14,136,355.50 +	3,767,259.32
Railway tax accruals	3,724,020.73	3,233,838.38 +	490,182.35
Uncollectible railway revenues	24,507.09	24,044.24 +	462.85
Railway operating income	14,155,087.00	10,878,472.88 +	3,276,614.12
Non-operating income	9,620,743.92	7,958,827.25 +	1,661,916.67
Gross income	23,775,830.92	18,837,300.13 +	4,938,530.79
Deductions from gross income	11,968,266.19	11,978,138.47 —	9,872.28
Net income	11,807,564.73	6,859,161.66 +	4,948,403.07
Disposition of net income:			
Income applied to sinking and other reserve funds	111,725.00	107,875.00 +	3,850.00
Income appropriated for investment in physical property	41,206.50	46,027.77 —	4,821.27
Total appropriations of income	152,931.50	153,902.77 —	971.27
Income balance transferred to credit of profit and loss	11,654,633.23	6,705,258.89 +	4,949,374.34

REVENUES

The operating revenues amounted to $69,077,423.56 this year, as compared with $62,111,552.25 last year, an increase of $6,965,790.31, or 11.21 per cent.

Revenue from the transportation of freight, including bridge tolls and miscellaneous freight, amounted to $50,045,039.44, an increase as compared with the previous year of $5,598,817.59, or 12.60 per cent. The increase in freight traffic was general in practically all classes of business, although the increase in the transportation of bituminous coal and lumber was more marked than in the other commodities. The tonnage of bituminous coal transported exceeded that of the previous year by 13.53 per cent and constituted 40.16 per cent of the total tonnage carried by the Company. The lumber moved, while not as great in volume as in the year ending June 30, 1914, showed an increase over last year of 20.77 per cent. The larger portion of the increase in freight revenue was on the lines north of Cairo and east of Dubuque, although there was a substantial increase in freight revenue on the lines south of the Ohio River and a moderate increase on the lines west of Dubuque.

Passenger revenue, including bridge tolls and miscellaneous passenger, amounted to $13,582,091.99, an increase over the preceding year of $730,414.61, or 5.68 per cent. The increase in the revenue from the transportation of passengers was general over the entire system, but the total revenue was not equal to that for the year ending June 30, 1914.

Table No. 12 contains general details as to freight and passenger traffic.

EXPENSES

The operating expenses for the year were $51,173,727.74, as compared with $47,975,196.75 the previous year, an increase of $3,198,530.99, or 6.67 per cent.

MAINTENANCE OF WAY AND STRUCTURES

The expenditures for maintenance of way and structures amounted to $9,506,526.60, being $640,276.26, or 7.22 per cent, in excess of the previous year. The increase was occasioned by large expenditures made to restore tracks and bridges damaged by the tornado and high water in and near New Orleans, La., in October, 1915, to increased rates of wages paid section men and to increased expenditures for maintenance of buildings, fences and miscellaneous other work.

Some of the important renewals made, the cost of which was charged to operating expenses, were as follows:

2,110,328 cross ties were renewed, being equivalent to 680.69 miles of continuous track, or 9.05 per cent of all ties in track, including sidings.

26.83 miles of track were relaid with new steel rail, and 13.89 miles with second-hand steel rail, replacing rail of the same weight.

5,647 lineal feet of pile and timber bridges were replaced by embankments.

1,899 lineal feet of iron and 3,110 lineal feet of concrete pipe culverts were installed.

382 miles of ballasted track were repaired or renewed to restore the track to its original standard.

For particulars as to work, the cost of which was charged wholly or in part to "Road and Equipment," attention is invited to remarks on page 10 of this report under "Physical Changes."

MAINTENANCE OF EQUIPMENT

Maintenance of equipment expenditures amounted to $16,547,749.43, being an increase of $2,603,944.95, or 18.67 per cent, as compared with last year. The greater portion of the increase for the year was due to heavier charges for repairs, depreciation and retirements of freight-train cars.

Charges for depreciation amounted to $2,652,185.01, being an increase over last year of $560,589.17.

207 locomotives received general repairs this year, as compared with 246 in the previous year, and 376 were given thorough repairs, as against 404 last year.

327 passenger train cars were given medium repairs this year, as against 561 last year, and 263 received heavy repairs, as compared with 148 last year.

The average mileage per serviceable locomotive for the year was 27,480 miles.

The average age of locomotives was 11.98 years, of revenue freight train cars 9.35 years and of passenger train cars 16.19 years.

TRAFFIC EXPENSES

Traffic expenses were $1,252,366.08, an increase of $13,634.38, or 1.10 per cent.

TRANSPORTATION EXPENSES

Transportation expenses amounted to $21,841,049.72, a decrease of $376,852.96, or 1.70 per cent. Additional superheater locomotives of greater tractive power were substituted on portions of the main lines for locomotives of lighter power, resulting in a further substantial increase in the train load. The special attention referred to in last year's report in connection with fuel economy, loss and damage and other claims has been continued and the results of the year's operations show substantial decreases in those items. Increases in the rates of pay have been granted to a number of the different classes of employes in the transportation department.

MISCELLANEOUS OPERATIONS

Expenses for miscellaneous operations were $375,222.27, an increase of $19,230.30, or 5.40 per cent, as compared with the preceding year.

GENERAL EXPENSES

General expenses amounted to $1,763,356.06, an increase of $107,561.60, or 6.50 per cent. The greater portion of this increase was due to expenses incurred by the Company in connection with the valuation of its physical property being made in accordance with the requirements of an act of Congress providing for the physical valuation of railroads.

TAXES.

Taxes amounted to $3,724,020.73 this year, being an increase of $490,182.35, or 15.16 per cent, as compared with last year. The greater portion of this increase was for taxes accruing to the State of Illinois, due in part to an increase in the Charter Tax caused by increased gross receipts on the Charter Line this year as compared with the previous year and partially to a substantial increase in the taxes on the Non-Charter Lines growing out of increase in levy rates throughout the State. There were substantial increases in taxes in other states through which the Company's lines extend, due in some instances to increased gross receipts and in other cases to increased levy rates and assessments. There was also a marked increase in the Federal Excise Tax.

FINANCIAL

The general balance sheet, Table No. 4, shows the financial condition of the Company at the close of the year, as compared with the previous year.

CAPITAL STOCK AND FUNDED DEBT

The Capital Stock remained unchanged during the year.

$1,900,000.00 of Illinois Central Equipment Trust Certificates, Series "D," were issued and sold in January, 1916.

There were delivered to the Trustee and cancelled under the terms of the mortgage, $2,000,000.00 Illinois Central Railroad Company First Lien Equipment Bonds. Additional bonds of this issue to the amount of $7,817,000.00 were also surrendered to the Trustee for cancellation in connection with the release of retired and other equipment covered by the mortgage.

There were retired and cancelled under the terms of the several Trust Agreements $800,000.00 of Illinois Central Equipment Trust Certificates, Series "A," $350,000.00 of Illinois Central Equipment Trust Certificates, Series "B," $198,000.00 of Ilinois Central Equipment Trust Certificates, Series "C," and $95,000.00 of Illinois Central Equipment Trust Certificates, Series "D."

SECURITIES OWNED.

There were acquired during the year $1,257,000.00 of The Yazoo & Mississippi Valley Railroad Company Five Per Cent Gold Improvement Bonds in liquidation of indebtedness for improvements made to that Company's property.

The entire capital stocks of the Herrin Northern Railroad Company, Fredonia & Reeds Railroad Company, Benton Southern Railroad Company, and Johnston City Southern Railroad Company, the amount in each case being $2,500.00, were purchased during the year. These companies were organized in the interest of your Company for the purpose of constructing several branch lines in the southern portion of the State of Illinois.

The Central Fruit Despatch, which was organized in January, 1912, to take over the refrigerator service business of this Company, having proved unprofitable, the operations were discontinued as of September 1, 1914. The liquidation of the Company's affairs was practically completed during the past year and your Company surrendered to the Central Fruit Despatch all but five shares of its Capital Stock and charged off to Profit and Loss $547,430.89, this sum representing the depreciation in value of the stock. The amount written off is included in the item "Miscellaneous Debits," in Table No. 3.

$70,000.00 of Chicago, St. Louis & New Orleans Railroad Company Equipment Trust Certificates, Series "A," held in the treasury matured and were redeemed during the year.

The Peoria & Pekin Union Railway Company redeemed $12,500.00 par value of its Five Per Cent Debenture Bonds, maturing August 1, 1915.

$96,000.00 par value of The Yazoo & Mississippi Valley Railroad Company Five Per Cent Gold Improvement Bonds were transferred to the Insurance Fund, and $56,000.00 par value were sold.

INSURANCE AND OTHER FUNDS.

The changes in the Insurance Fund during the year and the condition of the fund at the close of the year are shown in the following table:

	Year Ending June 30, 1916	Year Ending June 30, 1915
Amount at credit of fund beginning of year	$2,215,372.56	$2,129,835.52
Added through monthly charges to operating expenses	60,000.00	60,000.00
Collected from lessees account of insurance	1,099.92	1,099.92
Interest received on investments of the fund	111,725.00	107,875.00
Fire losses collected	29,784.20	12,604.82
	$2,417,981.68	$2,311,415.26
Losses by fire	$58,327.07	$50,714.86
Premiums paid for reinsurance	48,279.78	45,327.84
	$106,606.85	$96,042.70
Amount at credit of fund June 30	$2,311,374.83	$2,215,372.56

The balances in the sinking funds as of June 30, 1916, and the increases during the year were as follows:

The Farmers' Loan and Trust Company, Trustee—Cairo Bridge Contingent Fund, $504,180.00.

The Farmers' Loan and Trust Company, Trustee—Cairo Bridge Sinking Fund, $381,998.59, an increase of $37,418.35.

United States Trust Company of New York, Trustee—Sinking Fund for Western Lines Bonds, $1,522,298.45, an increase of $104,410.72.

United States Trust Company of New York, Trustee—Sinking Fund for Omaha Division Bonds, $210,869.15, an increase of $17,947.65.

ROAD AND EQUIPMENT

There was expended during the year for Road and Equipment (including improvements on subsidiary properties) $6,097,616.21. The following is a classified statement of these expenditures:

	Additions and Betterments on Owned Lines	Advances for Additions and Betterments to Lines of Subsidiary Companies
ROAD:		
Engineering	$42,513.68	$24,879.24
Land for transportation purposes	173,137.95	23,249.24
Grading	155,007.43	78,101.85
Tunnels and subways	76.27	253.39
Bridges, trestles and culverts	622,411.27	374,906.88
Ties	46,486.17	43,670.99
Rails	155,750.83	120,020.15
Other track material	224,672.48	258,537.41
Ballast	17,137.25	36,945.01
Track laying and surfacing	125,235.90	102,679.25
Right of way fences	5,581.76	8,653.30
Snow and sand fences and snowsheds	124.01	Cr. 124.17
Crossings and signs	112,123.00	14,098.21
Station and office buildings	154,609.23	Cr. 36,223.83
Roadway buildings	3,403.19	13,843.49
Water stations	36,021.52	35,599.95
Fuel stations	3,503.72	818.98
Shops and enginehouses	141,952.10	361,349.52
Grain elevators	1,066.59	Cr. 120.02
Wharves and docks	409.94	4,983.62
Coal and ore wharves	.....	2,478.21
Telegraph and telephone lines	2,684.39	10,579.84
Signals and interlockers	109.945.70	130,154.98
Power plant buildings	2,725.56	4,098.82
Power transmission systems	52.90	Cr. 633.15
Power distribution systems	1,163.71	.....
Power line poles and fixtures	407.61	2.89
Miscellaneous structures	430.63	.....
Paving	4,318.33	1,727.97
Roadway machines	69,535.09	1,164.06
Roadway small tools	30.29	Cr. 943.90
Assessments for public improvements	43,242.85	28,429.02
Revenues and operating expenses during construction	Cr. 300.00	.....
Other expenditures—Road	97,554.17	35,013.12
Shop machinery	39,674.77	25,811.31
Power plant machinery	8,760.00	7,382.98

	Covered by Equipment Trust Series "C"	Covered by Equipment Trust Series "D"		
EQUIPMENT:				
Steam locomotives	$Cr. 14,859.63	$1,076,574.46	Cr. 480.820.06	570.000.00
Freight train cars	Cr. 8,699.52	1,308,789.30	Cr. 448.165.59	
Passenger train cars	Cr. 421.70	.....	2,692.28	.....
Motor equipment of cars	.....	.....	8,000.00	.....
Floating equipment	.....	.....	Cr. 12,770.00	.....
Work equipment	.....	.....	Cr. 27,056.32	.....
GENERAL:				
Organization expenses	.....	.....	.....	18.10
Law	.....	.....	266.30	.....
Interest during construction	.....	.....	4,367.11	6,852.58
Other expenditures—General	.....	.....	.....	10.00
	$Cr. 23,980.85	$2,385,363.76	$1,447,964.01	$2,288,269.29

The following shows the amount advanced during the year to each of the subsidiary companies, these amounts being included in total advances shown in Table No. 6 of this report:

Chicago, St. Louis & New Orleans R. R.		$1,690,081.92
Canton, Aberdeen & Nashville R. R.		46,283.58
South Chicago R. R.		3,770.84
Blue Island R. R.		4,942.79
Dubuque & Sioux City R. R.		482,888.59
Kensington & Eastern R. R.		983.39
Batesville Southwestern R. R.		57.40
Bloomington Southern R. R.		12.30
Johnston City Southern R. R.	Cr.	2,496.50
Benton Southern R. R.		52,371.55
Herrin Northern R. R.		11,869.93
Fredonia & Reeds R. R.	Cr.	2,496.50
Total		$2,288,269.29

PHYSICAL CHANGES

The physical condition of the Company's road and equipment was materially improved during the year.

There is given below a summary of the principal improvements, the cost of which was wholly or partially charged to Road and Equipment.

ROADWAY AND STRUCTURES:

There were 249.78 miles of track laid with 90-pound new steel rail and 121.04 miles of track relaid with second-hand steel rail during the year, all of which replaced rail of lighter pattern.

Eighty-four new industrial sidings were built or extended, making a net addition for the year of 6.72 miles, after allowing for industrial tracks taken up.

One hundred and eighty-two new Company sidings were built or extended; allowing for tracks taken up there was a net addition for the year of 32.64 miles.

Freight yard facilities were increased at Indianapolis, Ind., by the construction of 2.54 miles of sidings, and at Dubuque, Ia., by the construction of 1.78 miles of track.

Grade reduction work between Princeton, Ky., and Paducah, Ky., including the enlargement of the yard facilities at Princeton, was completed during the year.

The grade crossing elimination work at Grand Crossing, Chicago, Ill., and also the grade reduction at Mattoon, Ill., were completed during the year. The elevation of tracks through Cicero, Ill., and the grade crossing elimination work between 79th Street and 116th Street, Chicago, Ill., were continued. Preliminary arrangements are being made for the elevation of tracks at Indianapolis, Ind.

A new draw bridge was installed over the New Basin Canal at New Orleans. Steel bridges on the Kentucky Division were strengthened, so as to permit of their use by Mikado type locomotives.

The renewal of bridges over the several street crossings between 63rd Street and 67th Street, Chicago, Ill., was begun during the year.

An electric interlocking plant was installed at Pontiac, Ill., replacing the mechanical one. The work of installing similar plants at Rockport, Ky., and at Pullman Junction, Ill., is in progress.

Subways were completed at Franklin Street, and Prairie Avenue, Decatur, Ill., Phinney Park Boulevard, Fort Dodge, Ia., and at Harahan, La.

New station buildings were completed at Storm Lake, Ia., Millwood, Ky., Kensington, Ill., Mt. Pulaski, Ill., Lincoln, Ill., and La Salle, Ill. Others are in course of construction at Raleigh, Ill., Argyle, Wis., and Bryant, Miss. Station buildings were enlarged or improved at Hallidayboro, Ill., Cherokee, Ia., Wingo, Ky., and Jackson, Miss.

The construction of a new office and depot building at 63rd Street, Chicago, Ill., was commenced.

New freight houses were constructed at Evansville, Ind., and Lincoln, Ill., and an extension is now being built to the freight house at Cairo, Ill.

Water stations were improved by the installation of 100,000 gallon steel tanks to replace wooden tanks of smaller capacity at Kensington, Ill., Olney, Ill., Freeport, Ill., Vandalia, Ill., Rockford, Ill., Gravel Switch, Ky., and Jackson, Tenn. At Benton, Ill., Dixon, Ill., Cherokee, Ia., and Fulton, Ky., the existing water facilities were improved.

New mechanical facilities, consisting of an engine house, car shop, wash-out plant, office and turntable, were constructed at Dyersburg, Tenn., and a ten stall roundhouse, eighty-five foot turntable, boiler and wash-out buildings, power house, oil house and cinder conveyors put in at Jackson, Tenn.

Improvements were made to mechanical facilities at Freeport, Ill., Waterloo, Ia., Fort Dodge, Ia., Cherokee, Ia., and Nonconnah Yard, Memphis, Tenn.

The erection of new mechanical coaling plants at Effingham, Ill., Assumption, Ill., Hart, Ill., Waterloo, Ia., and Cecilia, Ky., is in progress.

A new eighty-five foot steel turntable was installed at Clinton, Ill., and second-hand turntables were put in at Dodgeville, Wis., Corinth, Miss., and Aberdeen, Miss.

The installation of electric block signals reported in progress last year embracing 39.9 miles of track, was completed and additional installations made, aggregating in all an increase for the year of 294.1 miles of track. With the trackage previously equipped there was a total of 1,556.5 miles of protected track at the close of the year.

Block signals are now being installed at various points on the Mississippi and Louisiana Divisions aggregating 452.2 miles, at Unionville, Ind., 1.4 miles and between Munger and Coleman, Ill., 3.5 miles, a total of 457.1 miles. With the completion of the work on the Mississippi and Louisiana Divisions the railroad between Chicago, Ill., and New Orleans, La., will be completely block signalled.

7,663 lineal feet of permanent bridges and trestles were constructed, replacing pile and timber bridges, trestles and embankments.

1,652 lineal feet of permanent bridges and trestles were rebuilt or replaced by embankments.

30,058 lineal feet of pile and timber bridges or trestles were rebuilt or replaced by embankments.

EQUIPMENT:

Forty-eight Mikado type freight locomotives and three switching locomotives were added during the year. Seventy-two locomotives were retired and fifteen small saddle-tank type switching locomotives engaged in shop service were transferred to work equipment, resulting in a decrease of thirty-six locomotives for the year, but an increase of 1,121,318 pounds in the tractive power. During the year one Atlantic type and two Pacific type passenger engines were converted into superheated locomotives, thus increasing their tractive power 7,460 pounds. This increase is included in the general increase for the year as stated above.

No new passenger-train cars were added during the year. Fourteen cars, heretofore included in work equipment, were changed to passenger-train equipment as thirteen smoker and excursion cars and one mail and express car. Six passenger and chair cars, one smoker and excursion car, one baggage and express car and one coach assigned to mixed train service, or a total of nine cars were destroyed, resulting in a net increase of five passenger-train cars for the year.

One thousand one hundred and fifty-one new freight-train cars were

added and three thousand three hundred and eighty-one cars were sold, destroyed or transferred to other service, making a net decrease of two thousand two hundred and thirty cars during the year. Nine thousand one hundred and eighty-one cars were rebuilt during the year. In the process of rebuilding, only such parts of the original car were retained as were in first class condition, the result being that the rebuilt equipment was practically equal to new cars suitable to present day requirements. The average capacity of cars owned at the close of the year was 41.69 tons as against 41.46 tons last year, and the total capacity of cars was 2,567,570 tons, compared with 2,647,730 tons.

GENERAL REMARKS.

The volume of freight traffic handled and the revenue derived therefrom were the largest in the Company's history. A large portion of the increased revenue this year was undoubtedly due to a recovery from the depression in business existing last year. There was, however, a substantial increase in both the volume of tonnage and revenue over the year ended June 30, 1914, during which year the Company moved a larger volume of freight and received greater freight revenue than in any previous like period.

As a result of the large expenditures made in recent years for the extensive improvement of the road-bed and for increased facilities, as well as for the acquisition of a large number of heavy locomotives of increased tractive power and cars of greater capacity than those formerly in service, your company was in a position to take care of the increased volume of business during the past year with a material reduction in Transportation Expenses as compared with the two preceding years.

Equipment Trust Certificates amounting to $1,900,000 were issued under a lease and agreement dated January 3, 1916, known as "Illinois Central Equipment Trust, Series 'D,'" for the purpose of providing funds in part with which to pay for 50 locomotives and 1,000 refrigerator cars. The equipment covered by this Trust was received and placed in service during the year.

The number of the Company's stockholders as of June 30, 1916, was 10,697, as compared with 10,963 on the same date of the previous year.

The number of pensioners on the pay rolls at the close of the year was 530, and the amount of pensions paid during the year was $144,063.34, an increase of $14,794.01 over the preceding year.

The Board takes this opportunity of expressing its appreciation to the officers and employees for their loyal and efficient service during the past year.

By order of the Board of Directors.

C. H. MARKHAM,
President.

CHICAGO AND NORTH WESTERN RAILWAY COMPANY—FIFTY-SEVENTH ANNUAL REPORT

To the Stockholders of the Chicago and North Western Railway Company:

The Board of Directors submit herewith their report of the operations and affairs of the Chicago and North Western Railway Company for the fiscal year ending June 30, 1916.

Average number of miles operated, 8,107.82.

OPERATING REVENUES:		
Freight	$60,353,399.00	
Passenger	21,445,004.22	
Other Transportation	7,448,365.75	
Incidental	2,067,096.93	
Total Operating Revenues		$91,313,865.90
OPERATING EXPENSES (67.85 per cent. of Operating Revenues)		61,952,329.34
Net Revenue from Railway Operations		$29,361,536.56
RAILWAY TAX ACCRUALS (5.19 per cent. of Operating Revenues)	$4,741,527.44	
UNCOLLECTIBLE RAILWAY REVENUES	13,302.60	
		4,754,830.04
Railway Operating Income		$24,606,706.52
NONOPERATING INCOME:		
Rental Income	$841,242.34	
Dividend Income	1,561,932.00	
Income from Funded Securities	5,895.75	
Income from Unfunded Securities and Accounts, and Other Items	644,405.68	
Total Nonoperating Income		3,053,475.77
Gross Income, carried forward		$27,660,182.29
DEDUCTIONS FROM GROSS INCOME:		
Rental Payments	$941,168.86	
Interest on Funded Debt	9,312,124.54	
Other Deductions	124,378.87	
Total Deductions from Gross Income		10,377,672.27
Net Income		$17,282,510.02
DISPOSITION OF NET INCOME:		
Sinking Funds	$216,569.82	
Dividends—		
8% on Preferred Stock	1,791,600.00	
7% on Common Stock	9,108,015.00	
Total Appropriations		11,116,184.82
Balance Income for the year		$6,166,325.20

The operating results as compared with the preceding year were as follows:

Freight Revenue increased	$8,429,538.26
Passenger Revenue increased	916,560.76
Other Transportation Revenue increased	754,116.11
Incidental Revenue increased	433,975.47
Total Operating Revenues increased	$10,534,190.60
Operating Expenses increased	5,580,756.30
Net Revenue from Railway Operations increased	$4,953,434.30
Railway Tax Accruals increased	$224,584.34
Uncollectible Railway Revenues increased	6,047.96
	230,632.30
Railway Operating Income increased	$4,722,802.00

Of the Operating Expenses for the current fiscal year $36,001,249.65, or 58.11 per cent., was paid employes for Labor, as compared with $32,920,365.11, or 58.40 per cent., paid during the preceding fiscal year. The increase of $3,080,884.54 in the amount paid is accounted for as follows:

Increase account more time worked	$2,359,595.37
Increase account higher rates of compensation	721,289.17
	$3,080,884.54

FREIGHT TRAFFIC

The details of Freight Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
FREIGHT REVENUE	$51,923,860.74	$60,353,399.00	$8,429,538.26	16.23

	1915	1916	Percentage of Increase or Decrease
TONS OF REVENUE FREIGHT CARRIED	40,399,215	51,238,459	26.83 Inc.
TONS OF REVENUE FREIGHT CARRIED ONE MILE	6,216,280,599	7,412,265,747	19.24 Inc.
AVERAGE REVENUE RECEIVED PER TON	$1.29	$1.18	8.53 Dec.
AVERAGE REVENUE RECEIVED PER TON PER MILE	.84 of a cent	.81 of a cent	3.57 Dec.
AVERAGE DISTANCE EACH REVENUE TON WAS HAULED	153.87 miles	144.66 miles	5.99 Dec.
MILEAGE OF FREIGHT AND MIXED TRAINS	17,250,535	18,376,722	6.53 Inc.
AVERAGE NUMBER OF TONS OF REVENUE AND NON-REVENUE FREIGHT CARRIED PER TRAIN MILE:			
East of Missouri River	479.68	534.93	11.52 Inc.
West of Missouri River	203.49	208.93	2.67 Inc.
Whole Road	443.10	491.14	10.84 Inc.
AVERAGE NUMBER OF TONS OF REVENUE AND NON-REVENUE FREIGHT CARRIED PER LOADED CAR MILE	21.11	22.06	4.50 Inc.
AVERAGE FREIGHT REVENUE PER TRAIN MILE	$3.01	$3.28	8.97 Inc.

PASSENGER TRAFFIC

The details of Passenger Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase Amount	Increase Per Cent.
PASSENGER REVENUE	$20,528,443.46	$21,445,004.22	$916,560.76	4.46

	1915	1916	Percentage of Increase
REVENUE PASSENGERS CARRIED	33,079,550	33,328,529	.75 Inc.
REVENUE PASSENGERS CARRIED ONE MILE	1,130,297,641	1,155,960,132	2.27 Inc.
AVERAGE FARE PAID PER PASSENGER	62 cents	64 cents	3.23 Inc.
AVERAGE RATE PAID PER PASSENGER PER MILE	1.82 cents	1.86 cents	2.20 Inc.
AVERAGE DISTANCE TRAVELED PER REVENUE PASSENGER	34.17 miles	34.68 miles	1.49 Inc.
MILEAGE OF PASSENGER AND MIXED TRAINS	21,372,414	21,613,332	1.13 Inc.
AVERAGE PASSENGER-TRAIN REVENUE PER TRAIN MILE	$1.22	$1.27	4.10 Inc.

MAINTENANCE OF WAY AND STRUCTURES

The total Operating Expenses of the Company for the year ending June 30, 1916, were $61,952,329.34; of this amount $11,608,646.14 was for charges pertaining to the Maintenance of Way and Structures. Included in these charges is a large part of the cost of 82,109 tons of steel rails, the greater portion of which was laid in replacement of rails of lighter weight in 595.98 miles of track; also the cost of 3,819,928 new ties.

The charges for Maintenance of Way and Structures also include a portion of the cost of ballasting 35.01 miles of track with crushed stone, 126.16 miles with gravel, and 122.09 miles with cinders; the erection, in place of wooden structures, of 23 new steel bridges on masonry, and 12 on pile supports, aggregating 1,526 feet in length and containing 978 tons of bridge metal; and the replacement of other wooden structures with masonry arch and box culverts and cast-iron pipes, the openings being filled with earth. The wooden structures replaced by permanent work aggregate 5,227 feet in length.

The charges on account of Maintenance of Way and Structures for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase or Decrease
COST OF RAILS:			
New steel rails	$698,965.82	$1,030,246.34	$331,280.52 Inc.
Usable and re-rolled rails	842,610.97	1,258,888.83	416,277.86 Inc.
	$1,541,576.79	$2,289,135.17	$747,558.38 Inc.
Less value of old rails and other items	1,191,307.88	1,956,070.34	764,762.46 Inc.
Net charge for rails	$350,268.91	$333,064.83	$17,204.08 Dec.
COST OF TIES	1,547,651.05	2,198,949.95	651,298.90 Inc.
COST OF BALLAST	117,254.77	97,782.89	19,471.88 Dec.
COST OF OTHER TRACK MATERIAL	375,613.88	490,433.54	114,819.66 Inc.
ROADWAY AND TRACK LABOR AND OTHER EXPENSES	4,486,656.40	4,873,440.87	386,784.47 Inc.
Total Charges for Roadway and Track	$6,877,445.01	$7,993,672.08	$1,116,227.07 Inc.
Other Charges Account Maintenance of Way and Structures were as follows:			
BRIDGES, TRESTLES AND CULVERTS	833,833.69	697,475.13	136,358.56 Dec.
ROAD CROSSINGS, FENCES, ETC.	296,673.21	349,746.42	53,073.21 Inc.
SIGNALS AND INTERLOCKERS	419,141.63	495,382.14	76,240.51 Inc.
BUILDINGS, FIXTURES AND GROUNDS	995,745.24	1,017,182.13	21,436.89 Inc.
DOCKS AND WHARVES	88,452.05	78,824.30	9,627.75 Dec.
SUPERINTENDENCE	515,022.78	526,277.47	11,254.69 Inc.
ROADWAY TOOLS AND SUPPLIES	130,502,96	179,888.94	49,385.98 Inc.

	1915	1916	Increase or Decrease
Sundry Miscellaneous Charges	293,922.88	270,197.53	23,725.35 Dec.
Total Charges Account Maintenance of Way and Structures	$10,450,739.45	$11,608,646.14	$1,157,906.69 Inc.

The above charges for Maintenance of Way and Structures for the current year amount to 18.74 per cent. of the total Operating Expenses, as compared with 18.54 per cent. for the preceding fiscal year.

MAINTENANCE OF EQUIPMENT

The charges on account of Maintenance of Equipment for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase
Locomotives	$4,740,217.79	$5,369,889.08	$629,671.29 Inc.
Passenger train Cars	1,268,877.15	1,427,374.26	158,497.11 Inc.
Freight-train Cars	5,873,407.23	6,903,028.62	1,029,621.39 Inc.
Work Equipment	156,987.57	189,427.80	32,440.23 Inc.
Shop Machinery and Tools	170,396.43	216,939.52	46,543.09 Inc.
Superintendence	354,854.54	373,448.71	18,594.17 Inc.
Sundry Miscellaneous Charges	84,194.47	118,668.89	34,474.42 Inc.
Total Charges Account Maintenance of Equipment	$12,648,935.18	$14,598,776.88	$1,949,841.70 Inc.

The above charges for Maintenance of Equipment for the current year amount to 23.56 per cent. of the total Operating Expenses, as compared with 22.44 per cent. for the preceding fiscal year.

RESERVE FOR ACCRUED DEPRECIATION ON EQUIPMENT.

At the close of the preceding fiscal year there was a balance to the credit of Equipment Reserve Accounts of		$8,149,419.47
During the year ending June 30, 1916, there was credited to the Equipment Reserve Accounts on account of depreciation charges to Operating Expenses		2,536,813.01
		$10,686,232.48
And there was charged during the year against the above amount the Accrued Depreciation on Equipment retired or transferred from one class of service to another		445,842.44
Leaving a balance to the credit of the Equipment Reserve Accounts on June 30, 1916, of		$10,240,390.04

TRANSPORTATION EXPENSES

The Transportation Expenses of the Company for the year ending June 30, 1916, were $32,119,222.84, or 51.85 per cent. of the total Operating Expenses. Of this amount $20,799,544.55, or 64.76 per cent., was charged for labor; $6,405,078.70, or 19.94 per cent., was charged for fuel for locomotives; and $4,914,599.59, or 15.30 per cent., was charged for supplies and miscellaneous items. The increase in the Transportation Expenses for the year ending June 30, 1916, as compared with the preceding fiscal year, was $2,365,778.78, or 7.95 per cent., distributed as follows:

Increase in amount charged for labor	$1,530,904.19	
Increase in amount charged for fuel for locomotives	562,507.06	
Increase in amount charged for supplies and miscellaneous items	272,367.53	
		$2,365,778.78

CAPITAL STOCK

There was no change during the year in the Capital Stock and Scrip of the Company.

Special stock to the par value of $65,000.00, issued in 1873, has, in accordance with the rules of the Interstate Commerce Commission and as a matter of record, been brought upon the books of the Company. This stock being considered of merely nominal value has not heretofore been shown.

The Company's authorized Capital Stock is Two Hundred Million Dollars ($200,000,000.00), of which the following has been issued to June 30, 1916:

Outstanding:		
Common Stock and Scrip	$130,117,028.82	
Preferred Stock and Scrip	22,395,120.00	
Special Stock	65,000.00	
Total Stock and Scrip Outstanding		$152,577,148.82
Owned by the Company:		
Common Stock and Scrip	$2,338,502.15	
Preferred Stock and Scrip	3,834.56	
Total Stock and Scrip Owned by the Company		2,342,336.71
Total Capital Stock and Scrip, June 30, 1916		$154,919,485.53

FUNDED DEBT

At the close of the preceding fiscal year the amount of Funded Debt, exclusive of Bonds in the Treasury and Due from Trustee, was			$210,581,000.00
The above amount has been decreased during the year ending June 30, 1916, by Bonds and Equipment Trust Certificates redeemed, as follows:			
C. R. & M. R. R. R. Third Division First Mortgage, 7%, Redeemed		$2,332,000.00	
North Western Union Ry. First Mortgage, 7%, Redeemed		65,000.00	
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%, redeemed		65,000.00	
C. & N. W. Ry. Sinking Fund of 1879, 5%, redeemed		187,000.00	
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%, redeemed		269,000.00	
C. & N. W. Ry. Equipment Trust Certificates of 1912, 4½%, redeemed, viz.:			
Series A	$300,000.00		
Series B	300,000.00		
Series C	400,000.00		
		1,000,000.00	
Total Funded Debt Redeemed			3,918,000.00
			$206,663,000.00
And the above amount has been increased by Bonds sold during the year, as follows:			
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5% sold to reimburse the Company for past expenditures made for construction and in redeeming matured bonds			7,972,000.00
Total, June 30, 1916			$214,635,000.00
Net Increase during the year			$ 4,054,000.00

BONDS IN THE TREASURY AND DUE FROM TRUSTEE

At the close of the preceding fiscal year the amount of the Company's Bonds in the Treasury and due from Trustee was			$ 7,908,000.00
The above amount has been increased during the year ending June 30, 1916, as follows:			
C. & N. W. Ry. Consolidated Sinking Fund Currency of 1915, 7%, Redeemed	$ 163,000.00		
C. R. & M. R. R. R. Third Division First Mortgage, 7%, Redeemed	2,332,000.00		
North Western Union Ry. First Mortgage, 7%, Redeemed	65,000.00		
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%, Redeemed	65,000.00		
C. & N. W. Ry. Sinking Fund of 1879, 5%, Redeemed	188,000.00		
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%, Redeemed	269,000.00		
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, Received on Account of Construction Expenditures made during the year	1,000,000.00		
		4,082,000.00	
		$11,990,000.00	
The Bonds on hand and due from Trustee have been decreased during the year, as follows:			
C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, Sold to Reimburse the Company for Past Expenditures made for Construction and in Redeeming Matured Bonds	$7,972,000.00		
C. & N. W. Ry. Equipment Trust Certificates of 1913, 4½%, Retired	400,000.00		
		8,372,000.00	
Total, June 30, 1916			$ 3,618,000.00
Net Decrease during the year			$ 4,290,000.00

In addition to the foregoing transactions, the following Treasury Bonds were exchanged for an equal amount of C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, viz.:

C. & N. W. Ry. Consolidated Sinking Fund Currency, 7%	$ 163,000.00
C. R. & M. R. R. R. Third Division First Mortgage Bonds, 7%	2,332,000.00
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%	40,000.00
C. & N. W. Ry. Sinking Fund Bonds of 1879, 5%	136,000.00
C. & N. W. Ry. Sinking Fund Debentures, 1933, 5%	200,000.00
	$2,871,000.00

CONSTRUCTION

The construction charges for the year ending June 30, 1916, were as follows:

On Account of Additional Main Tracks, viz.:	Miles		
Second Track. Otis to Cedar Rapids, Iowa	3.43	$ 71,293.46	
Second Track, Cedar Rapids to Beverly, Iowa	4.80	30,300.18	
			$ 101,593.64
On Account of Extensions, viz.:			
Kingston Extension, Wisconsin	15.54	$ 214,124.08	
Koepenick Extension, Wisconsin	8.73	5,408.10	
			219,532.18
On Account of Elevating Tracks, viz.:			
Greenfield Avenue north, Milwaukee, Wis			267,076.45
Sundry Construction:			
Land for Transportation Purposes		$ 744,783.36	
Buildings and Fixtures		642,814.48	
Bridges, Trestles and Culverts		618,500.15	
New Sidings, Yard Tracks and Spurs to Industries		287,369.39	
Crossings and Signs		127,785.08	
Signals and Interlockers		88,742.62	
Betterment of Roadway and Track		1,206,163.15	
Shop Machinery		53,125.81	
Extension of Ore Docks, Ashland, Wis		315,696.39	
Calumet Terminal Elevator, Chicago, Illinois		806,310.83	
Kinnickinnic Elevator, Milwaukee, Wis		691,417.05	
Miscellaneous Construction, including Fences, Wharves and Docks, and other items		169,806.16	
			5,752,514.47
Equipment:			
35 Steam Locomotives, 2,800 Freight-train Cars, 50 Passenger-train Cars, and 6 Work Equipment Cars		$3,413,143.41	
Improvement of Equipment		464,409.92	
		$3,877,553.33	
Less Original Cost of Equipment Retired, as follows:			
28 Locomotives		$ 217,451.31	
3,928 Freight-train Cars		1,983,080.30	
14 Passenger-train Cars		55,237.20	
338 Work Equipment Cars		58,847.67	
Other Items		88,043.09	
		2,402,659.57	
			1,474,893.76
			$7,815,610.50

LANDS

During the year ending June 30, 1916, 3,417.69 acres and 71 town lots of the Company's Land Grant lands were sold for the total consideration of $107,525.92. The number of acres remaining in the several Grants June 30, 1916, amounted to 314,448.61 acres, of which 9,125.68 acres were under contract for sale, leaving unsold 305,322.93 acres.

Appended hereto may be found statements, accounts, and statistics relating to the business of the fiscal year, and the condition of the Company's affairs on June 30, 1916.

By order of the Board of Directors.

RICHARD H. AISHTON,
President.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY—THIRTY-EIGHTH ANNUAL REPORT

RICHMOND, VA., September 21. 1916.

TO THE STOCKHOLDERS:

The Thirty-eighth Annual Report of the Board of Directors, for the fiscal year ended June 30, 1916, is herewith submitted.

The average mileage operated during the year by The Chesapeake and Ohio Lines was 2,375.2 miles, an increase over the previous year of 6.0 miles. The mileage at the end of the year was 2,385.6 miles, an increase of 13.9 miles over mileage on June 30, 1915. See schedule on page 12.

RESULTS FOR THE YEAR.

Operating Revenues were	$48,239,012.10
(Increase $8,774,975.11, or 22.24%.)	
Operating Expenses were	31,789,179.22
(Increase $4,232,765.72, or 15.36%.)	
Net Operating Revenue was	$16,449,832.88
(Increase $4,542,209.39, or 38.15%.)	
Taxes were	1,587,407.08
(Increase $237,910.12, or 17.63%.)	
Operating Income, Taxes deducted, was	$14,862,425.80
(Increase $4,304,299.27, or 40.77%.)	
Miscellaneous Income was	1,181,534.42
(Increase $163,315.34, or 16.04%.)	
	$16,043,960.22
Rentals and Other Payments were	988,290.27
(Increase $173,523.14, or 21.30%.)	
Income for the year available for interest was	$15,055,669.95
(Increase $4,294,091.47, or 39.90%.)	
Interest (54.31% of amount available) amounted to	8,176,454.11
(Increase $78,412.25, or 0.95%.)	
Net Income for the year, equivalent to 10.96% on capital stock outstanding, amounted to	$6,879,215.84
(Increase $4,215,679.22, or 158.27%.)	

RETURN ON PROPERTY.

The following table shows the amount of return to your Company, from transportation operations only, upon its investment in road and equipment at the termination of each fiscal year of the five year period ended June 30, 1916:

	Property Investment.	Total Operating Income.	Percentage of Return.
Fiscal year ended June 30, 1916	$248,710,261.86	$14,410,191.96	5.79%
Fiscal year ended June 30, 1915	246,193,467.59	10,058,639.87	4.09%
Fiscal year ended June 30, 1914	243,132,472.21	9,844,660.14	4.05%
Fiscal year ended June 30, 1913	236,429,988.62	9,273,205.37	3.92%
Fiscal year ended June 30, 1912	230,650,068.20	10,532,941.88	4.57%
Yearly average for five fiscal years ended June 30, 1916	$241,023,251.70	$10,823,927.84	4.49%

FINANCIAL.

The changes in funded debt in the hands of the public during the year were as follows:

	Sold	Retired
5 per cent. Convertible Thirty-year Secured Gold Bonds	$40,180,000.00	
4½ per cent. Equipment Trust Certificates—Series "O"	3,160,000.00	
5 per cent. Five Year Secured Gold Notes		$33,000,000.00
5 per cent. Kineon Coal Company First Mortgage Bonds		200,000.00
4 per cent. Big Sandy Ry. First Mortgage Bonds		56,000.00
4 per cent. Coal River Ry. First Mortgage Bonds		34,000.00
4 per cent. Greenbrier Ry. First Mortgage Bonds		19,000.00
4 per cent. Raleigh & Southwestern Ry. First Mortgage Bonds		5,000.00
Equipment Trust Obligations		1,255,392.00
	$43,340,000.00	$34,569,392.00
Net Increase	8,770,608.00	

Other changes in obligations shown under funded debt on balance sheet of June 30, 1916, were as follows:

	Increase	Payments
5 per cent. First Lien and Improvement Mortgage Bonds	$6,995,000.00	
6 per cent. Equipment Contracts—General Equipment Co.		$9,400.00
5 per cent. Equipment Contract—Standard Steel Car Co.		612,667.01
5 per cent. Equipment Contract—Central Locomotive and Car Works		66,488.38
6 per cent. Equipment Contract—American Locomotive Co.		156,046.28
5½ per cent. Equipment Contract—Central Locomotive and Car Works	725,000.00	215,000.00
	$7,720,000.00	$1,059,601.67
Net Increase	6,660,398.33	

Five per cent. Convertible Thirty Year Secured Gold Bonds, of a face amount of $40,180,000, maturing April 1, 1946, were issued under a closed mortgage dated April 1, 1916, to Central Trust Company of New York, trustee, secured by a face amount of $45,920,000 of your company's First Lien and Improvement Mortgage Bonds and sold to provide funds for the retirement of $33,000,000 Five Year five per cent. Secured Gold Notes called for payment at a premium of 1%, June 1, 1916, and for other capital purposes.

Four and one-half per cent. Equipment Trust Certificates Series "O," amounting to $3,160,000, were issued and sold to provide funds for payment of equipment shown in table on page 19.

Five per cent. First Lien and Improvement Mortgage Bonds, of a face amount of $6,995,000 were issued during the year for additions and betterments and other capital purposes. Of the aggregate of these bonds outstanding, $1,345,000 are held in the treasury for future additions and betterments.

Your Company acquired during the year 18,496 additional shares of the capital stock of The Chesapeake and Ohio Northern Railway Company, payment for which was made out of cash derived from the sale of The Kanawha and Michigan Railway Company stock mentioned on page 7 of last year's report. Of the proceeds of the sale there is still deposited with the Trustee for future investment the sum of $2,129,000.

There were also acquired 591 shares of capital stock of the Pond Fork Railway Company, which is constructing a line of railroad from a point near Madison, W. Va., up Pond Fork of Coal River, and additional shares of capital stock of the White Sulphur Springs, Inc., and The Cincinnati Inter-Terminal Railroad Company. Additional First Mortgage Bonds of the Elkhorn and Beaver Valley Railway Company were acquired at par in reimbursement for advances for construction purposes.

Securities of The Chesapeake and Ohio Equipment Corporation, issued in respect of the cost of twenty-four Mallet locomotives, were acquired by your Company and the cost of same is included in property account.

Further shares of stock and First Mortgage Bonds of The Chesapeake and Ohio Railway Company of Indiana were issued in respect of the cost of certain additions and betterments made to that line, and were pledged under your Company's First Lien and Improvement Mortgage.

A statement of charges to property accounts will be found on page 16, showing a net addition of $2,527,411.09; that is, $1,551,837.61 was added to cost of road and $975,573.48 was added to cost of equipment.

A schedule of securities owned June 30, 1916, will be found on page 17.

During the past seven years your Company's increase in capital liabilities in hands of the public, its principal acquisition of stocks and bonds of other companies, and its expenditures for equipment, branch line construction, second track and other additions and betterments, have been as follows:

CAPITAL OBLIGATIONS ISSUED OR ASSUMED:	PAR VALUE.		
General Mortgage 4½% Bonds	$3,716,000.00		
First Consolidated Mortgage 5% Bonds	2,000,000.00		
Convertible 4½% Debentures.	31,390,000.00		
Three Year 4½% Collateral Trust Notes	25,000,000.00		
One Year 5% Collateral Trust Notes	3,500,000.00		
Five Year 5% Collateral Trust Notes	33,000,000.00		
C. & O. Convertible 5% Secured Gold Bonds	40,180,000.00		
Coal River Railway Co. First Mortgage 4% Bonds	3,000,000.00		
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	860,000.00		
Big Sandy Railway Co. First Mortgage 4% Bonds	229,000.00		
Virginia Air Line Railway Co. First Mortgage 5% Bonds	900,000.00		
Equipment Trust Certificates Series "N"	1,700,000.00		
Equipment Trust Certificates Series "O"	3,160,000.00		
Equipment Contracts, Various.	4,809,390.00		
	$153,444,390.00		
Realizing		$145,428,990.92	
Less: CAPITAL OBLIGATIONS PAID OR PURCHASED:			
Peninsula Division First Mortgage 6% Bonds matured January 1, 1911	$2,000,000.00		
Greenbrier and New River Railroad Co. First Mortgage 5% Bonds redeemed February 1, 1911	339,000.00		
General Funding and Improvement Mortgage 5% Bonds.	7,302,000.00		
Greenbrier Railway Co. First Mortgage 4% Bonds retired November 1, 1911	2,000.00		
Three Year 4½% Collateral Trust Notes	25,000,000.00		
One Year 5% Collateral Trust Notes	3,500,000.00		
Five Year 5% Secured Gold Notes	33,000,000.00		
Kineon Coal Co. First Mortgage Bonds	200,000.00		
Equipment Trust Payments..	12,027,000.00		
Through Sinking Funds:			
Big Sandy Railway Co. First Mortgage 4% Bonds	382,000.00		
Coal River Railway Co. First Mortgage 4% Bonds	191,000.00		
Greenbrier Railway Co. First Mortgage 4% Bonds	137,000.00		
Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds	43,000.00		
	$84,123,000.00		
Costing		84,719,147.09	
			$60,709,843.83
ACQUISITIONS:			
Stocks of:			
The C. & O. Railway Co. of Indiana	$5,998,800.00		
Elkhorn and Beaver Valley Railway Co.	30,000.00		
Gauley and Meadow River Railroad Co.	116,300.00		
The Hocking Valley Railway Co.	7,671,900.00		
The Cincinnati Inter-Terminal Railroad Co.	56,000.00		
Logan and Southern Railway Co.	292,100.00		
Levisa River Railroad Co. (of Ky.)	50,000.00		
The Levisa River Railroad Co. (of Va.)	50,000.00		
Kanawha Bridge and Terminal Co.	400,000.00		
The Silver Grove Land and Building Co.	200,000.00		
White Sulphur Springs, Incorporated	2,560,000.00		

ACQUISITIONS (*Continued*)		
First National Bank Building Corporation (Richmond, Va.)	180,000.00	
The Chesapeake and Ohio Northern Railway Co.....	1,897,500.00	
Pond Fork Railway Co.....	59,100.00	
Miscellaneous	30,000.00	
	$19,592,600.00	
Costing		$20,928,771.89
Bonds of:		
The C. & O. Railway Co. of Indiana First Mortgage 5%.	$6,869,000.00	
Elkhorn and Beaver Valley Railway Co. First Mortgage 5%	1,031,000.00	
Miscellaneous	218,000.00	
	$8,118,000.00	
Costing		6,717,170.13
Properties of:		
Coal River Railway Co.....	$2,304,359.88	
Raleigh and Southwestern Railway Co.	816,562.42	
Virginia Air Line Railway Co.	1,071,947.12	
Costing		4,192,869.42
Construction of:		
Extension of Branch Lines, costing	$1,595,592.15	
Second Track (176.5 miles) and Additions and Betterments, costing	16,488,838.92	
(Excluding $2,320,823.99 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		18,084,431.07
Equipment:		
Additional equipment acquired (less retirals)		19,849,327.85
(Excluding $24,586.89 expended on Chicago Line to April 30, 1916, for which securities have been acquired.)		
Costing		$69,772,570.36

GENERAL REMARKS.

The equipment inventory as of June 30, 1916, was as follows:			
Locomotives owned	610	Inc.	5
Locomotives leased	217	Inc.	5
Total	827	Inc.	10
Passenger train cars owned.....	341	Dec.	17
Passenger train cars leased.....	29	....	..
Total	370	Dec.	17
Freight train and miscellaneous cars owned....23,868		Dec.	43
Freight train cars leased.....20,902		Dec.	1,533
Total 44,770		Dec.	1,576

The decrease in equipment is due principally to the retiral of old equipment, in place of which your Company has contracted for 2,000 70-ton steel coal cars, 1,000 30-ton box cars and 20 passenger train cars.

The charges during the year in the accrued depreciation of equipment account were as follows:

Balance to credit of account June 30, 1915.....		$4,904,279.67
Amount credited during year ended June 30, 1916, by charges to:		
Operating expenses	$794,073.45	
Charges to account for:		
Accrued depreciation on equipment retired during year—		
34 locomotives, 3 passenger train cars, 4,138 freight train and work cars and 2 barges.....$333,034.80		
Accrued depreciation on cars changed in class during year.....	7,788.69	340,823.49
		453,249.96
Balance to credit of account June 30, 1916.....		$5,357,529.63

	1916	1915		
Operating Revenues amounted to $48,239,012.10		$39,464,036.99	Inc.	$8,774,975.11
Net Operating Revenue.....$16,449,832.88		$11,907,623.49	Inc.	$4,542,209.39
Operating Ratio	65.9%	69.8%	Dec.	3.9%
Tons of Revenue Freight carried one mile 10,296,523.340		8,138,347,516	Inc.	2,158,175,824
Revenue train load, tons...	1,003	906	Inc.	97
Revenue tons per loaded car	34.0	32.3	Inc.	1.7

Among the new local industries are the following: 26 manufactories of mineral, metal and other products, 9 manufactories of farm implements and farm products, 3 manufactories of lumber products, all giving employment to approximately 3,700 persons, with annual pay roll of approximately $2,300,000, producing approximately 8,350 car loads of inbound and outbound freight. At the close of the year, there were on your Company's lines 330 separate mines for producing coal and coke, all of which were in actual operation. Of the 1,304 coke ovens, 1,154 were in operation. Of the 14 iron furnaces, having a total daily capacity of 2,705 tons, 13, having a daily capacity of 2,605 tons, were in operation. During the year 174 new settlers were located on your Company's lines, their purchases aggregating 87,950 acres.

The construction of The Chesapeake and Ohio Northern Railway is rapidly approaching completion, and this line will doubtless be in operation in time to handle coal shipments for the Great Lakes at the opening of navigation in the spring of 1917. This line extends from Limeville, Kentucky, on your Company's main line, to the line of the Norfolk and Western Railway near Waverly, Ohio, a distance of 30.4 miles; and this will afford a short route to the lake for shipments from your Company's lines through trackage rights already arranged for over the Norfolk and Western Railway from Waverly to the Hocking Valley Railway at Valley Crossing near Columbus.

A spur track 4.7 miles in length, leaving the main line at Penniman Junction, just east of Williamsburg, Va., and extending to the plant of the E. I. du Pont de Nemours Company at Penniman, has been completed.

Extensions during the year have been completed as follows: An extension of Gauley and Rich Creek Branch 0.1 mile, Dingess Run Branch of the Guyandot Valley Line 0.8 mile, Horse Creek Branch 5.1 miles, Peter Cave Fork Branch 2.0 miles, and Beech Creek extension of the Coal River Line 1.6 miles. 3.4 miles of second track between Balcony Falls, Va., and Greenlee, Va., have been completed and 0.3 mile of track of the Raleigh and Southwestern Branch has been abandoned. The change of line at Walbridge, Ky., resulted in a decrease of 0.1 mile of track.

The revenue coal and coke tonnage was 26,979,519, an increase of 26.5 per cent; other freight tonnage was 10,640,135, an increase of 22.0 per cent. Total revenue tonnage was 37,619,654 tons, an increase of 25.2 per cent. Freight revenue was $39,079,087.19, an increase of 24.9 per cent. Freight train mileage was 10,262,082 miles, an increase of 14.3 per cent. Revenue ton miles were 10,296,523,340, an increase of 26.5 per cent. Ton mile revenue was 3.80 mills, a decrease of 1.0 per cent. Revenue per freight train mile was $3.808, an increase of 9,3 per cent. Revenue tonnage per train mile was 1,003 tons, an increase of 10.7 per cent. including Company's freight, the tonnage per train mile was 1,064 tons, an increase of 10.6 per cent. Tonnage per locomotive, including Company's freight, was 937 tons, an increase of 7.7 per cent. Revenue tonnage per loaded car was 34.0 tons, an increase of 5.3 per cent. Tons of revenue freight carried one mile per mile of road were 4,335,013, an increase of 26.2 per cent.

There were 6,804,183 passengers carried, an increase of 4.9 per cent. The number carried one mile was 281,348,788, an increase of 4.4 per cent. Passenger revenue was $5,998,043.81, an increase of 5.3 per cent. Revenue per passenger per mile was 2.132 cents, an increase of 0.8 per cent. Number of passengers carried one mile per mile of road was 118,453, an increase of 4.2 per cent. Passenger train mileage was 4,963,002, a decrease of 0.9 per cent. Passenger revenue per train mile was $1.208, an increase of 6.2 per cent; including mail and express, it was $1.425, an increase of 5.9 per cent. Passenger service train revenue per train mile was $1.463, an increase of 6.4 per cent.

There were 23,920.5 tons of new rails (1,265.3 tons 125-lb., 16,727.1 tons 100-lb., 204.5 tons 97-lb. Frictionless rail, and 5,723.6 tons 90-lb.) equal to 154.7 track miles, used in renewal of existing main tracks.

There were 1,763,343 Cross Ties used in maintaining existing tracks, an increase of 126,700.

There were 899,507 yards of ballast (507,609 stone) used in maintaining existing tracks, an increase of 314,066 yards.

The average amount expended for repairs per locomotive operated was $3,291.41; per passenger train car $1,021.40; per freight train car $106.38.

Effective January 1, 1916, Mr. E. D. Hotchkiss was promoted from General Freight Agent to the position of Freight Traffic Manager; Mr. Thornton Lewis from General Western Freight Agent, to Assistant Freight Traffic Manager; and Mr. A. P. Gilbert from Assistant General Freight Agent to General Freight Agent.

Effective July 1, 1916, the following appointments were made: Mr. E. W. Grice, Assistant to President; Mr. J. P. Stevens, General Manager; Mr. E. P. Goodwin, General Inspector of Transportation; Mr. W. L. Booth, Superintendent Freight Transportation; Mr. L. B. Allen, General Superintendent, Central General Division; Mr. E. L. Bock, Superintendent, Huntington and Big Sandy Divisions; Mr. G. J. Derbyshire, Superintendent, C. & O. Ry. of Indiana.

The thanks of the Board are tendered to the officers and employes for loyal and efficient services performed during the year.

By order of the Board of Directors.

GEO. W. STEVENS,
President.

FRANK TRUMBULL,
Chairman.

GENERAL INCOME ACCOUNT.

For Year ended June 30, 1916, and Comparison with Year ended June 30, 1915.

TABLE 2.

OPERATING REVENUES:	1916.	1915.	INCREASE OR DECREASE.	PER CENT.
Freight Traffic $39,079,087.19		$31,288,536.62	$7,790,550.57	24.9
Passenger Traffic	5,998,043.81	5,696,088.37	301,955.44	5.3
Transportation of Mails	448,571.67	438,666.73	9,904.94	2.3
Transportation of Express	627,919.43	602,911.91	25,007.52	4.1
Miscellaneous	2,085,390.00	1,437,833.36	647,556.64	45.0
Total Operating Revenues $48,239,012.10		$39,464,036.99	$8,774,975.11	22.2
OPERATING EXPENSES:				
Maintenance of Way and Structures	$5,553,447.40	$4,694,522.17	$858,925.23	18.3
Maintenance of Equipment	10,561,093.51	8,243,170.36	2,317,823.15	28.1
Traffic	645,188.50	650,406.20	—5,217.70	1.0
Transportation	13,809,686.28	12,896,078.82	913,607.46	7.1
Miscellaneous Operations	288.847.19	232,347.26	56,499.93	24.3
General	953,684.76	873,882.70	79,802.06	9.1
Transportation for Investment Cr.....	*22,768.42*	*33,994.01*	*—11,225.59*	*33.0*
Total Operating Expenses $31,789,179.22	65.9%	$27,556,413.50 69.8%	$4,232,765.72	15.4
Net Operating Revenue	16,449,832.88	11,907,623.49	4,542,209.39	38.1
Railway Tax Accruals	1,587,407.08	1,349,496.96	237,910.12	17.6
Uncollectible Railway Revenues	20,208.19	8,212.83	11,995.36	146.1
	$1,607,615.27	$1,357,709.79	$249,905.48	18.4
Railway Operating Income $14,842,217.61		$10,549,913.70	$4,292,303.91	40.7
INCOME FROM OTHER SOURCES:				
Hire of Equipment...	$214,667.99	$77,632.04	$137,035.95	177.0
Interest from Investments and Accounts	677,319.36	635,345.97	41,973.39	6.6
Miscellaneous	289,547.07	305,241.07	—15,694.00	5.1
	$1,181,534.42	$1,018,219.08	$163,315.34	16.0
Gross Income.....$16,023,752.03		$11,568,132.78	$4,455,619.25	38.5
DEDUCTIONS FROM GROSS INCOME:				
Interest on Debt.....	$8,176,454.11	$8,098,041.86	$78,412.25	1.0
Rentals Leased Roads, Joint Tracks, &c ...	901,505.40	860,074.09	41,431.31	4.8

Deductions from Gross Income:	1916.	1915.	Increase or Decrease.	Per Cent.
Loss on C. & O. Grain Elevator	11,723.50	Cr. 88,696.23	100,419.73	113.2
Miscellaneous	54,853.18	35,176.44	19,676.74	55.9
Total Deductions	$9,144,536.19	$8,904,596.16	$239,940.03	2.7
Net Income	$6,879,215.84	$2,663,536.62	$4,215,679.22	158.3

Amount to credit of Profit and Loss June 30, 1915		$2,947,539.83
Amount of Net Income for year ended June 30, 1916, transferred to Profit and Loss		6,879,215.84
		$9,826,755.67
Discount and Expense on Securities issued during the year ended June 30, 1916	$2,484,602.35	
Premium on Five Year Secured Gold Notes called for payment, June 1, 1916	330,202.76	
Refunds under West Virginia two cent fare law	2,654.70	
Appropriation of Surplus to Sinking and Other Reserve Funds	57,000.00	
		$2,874,459.81
		$6,952,295.86
Add Sundry adjustments		37,598.50
Balance to credit of Profit and Loss June 30, 1916		$6,989,894.36

GENERAL BALANCE SHEET JUNE 30, 1916.

ASSETS

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

Table 3.

Property Investment.		
Cost of Road		$173,439,123.66
Cost of Equipment		50,887,476.65
		$224,326,600.31
Improvements on Leased Railway Property		3,770.14
Securities of Proprietary, Affiliated and Controlled Companies—Pledged.		
Stocks—See Schedule, page 18	$12,958,599.44	
Bonds—See Schedule, page 18	4,110,407.01	
	$17,069,006.45	
Securities—Issued or Assumed—Pledged.		
Bonds—See Schedule, page 18 (Includes First Lien and Improvement Mortgage 5% Bonds $45,920,000.00. See Contra.)	45,920,001.00	
		— $62,989,007.45
Miscellaneous Investments.		
Physical Property		340,421.90
Special Funds, and Funded Debt Issued and Reserved.		
First Lien and Improvement Mortgage Bonds — Available for Additions and Betterments	$1,345,000.00	
R. & S. W. R'y Co., First Mortgage Bonds —Reserved for Construction	40,000.00	
Potts Creek Branch—Cash	44,987.59	
Special Deposits account of Construction and Equipment (Includes Cash and Note—Balance Proceeds K. & M. Ry. Co. Stock Sale)	6,158,219.39	7,588,206.98
		$70,917,636.33
		$295,248,006.78
Working Assets.		
Cash in Treasury	$5,903,395.30	
Cash in Transit	1,101,775.54	
	$7,005,170.84	
Cash deposits to pay Interest and Dividends	447,778.33	
Cash deposit to pay Equipment Trust Principal	112,000.00	
Cash deposits to pay Matured Bonds and Script	514,154.17	
Cash deposit to pay C. & O. Grain Elevator Insurance Claims	16,268.78	
Loans and Bills Receivable	525,110.82	
Traffic Balances	1,213,282.17	
Agents and Conductors	868,188.95	
Miscellaneous Accounts Receivable	1,202,937.94	
Other Working Assets	51,824.11	
		$11,956,716.11
Materials and Supplies		3,231,713.23
Securities in Treasury—Unpledged.		
Stocks—See Schedule, page 17	$4,829,223.45	
Bonds—See Schedule, page 17	657,551.75	5,486,775.20
Deferred Assets.		
Unmatured Interest, Dividends and Rents	$93,189.79	
Advances to Proprietary, Affiliated and Controlled Companies	106,417.92	
Advances, Working Funds (Fast Freight Lines, etc.)	37,466.18	
Special Deposits with Trustees, Various Mortgage Funds	35,073.81	
Cash and Securities in Sinking Funds	59,886.01	
Cash and Securities in Insurance Reserve Fund	59,319.04	
Sundry Accounts	436,259.66	827,612.41
		$21,502,816.95
Total		$316,750,823.73

LIABILITIES.

(Excluding Stocks and Bonds owned of The C. & O. Ry. Co. of Indiana and of The C. & O. Equipment Corporation.)

Capital Stock.			
Common		$62,792,600.00	
First Preferred		3,000.00	
Second Preferred		200.00	
			$62,795,800.00
Common—The Chesapeake and Ohio Railway Co. of Indiana			$1,200.00
			$62,797,000.00
Funded Debt.			
First Mortgage, Terminal, etc., 6% Bonds	1922	$142,000.00	
General Funding and Improvement, 5% Bonds	1929	3,698,000.00	
Convertible, 4½% Bonds	1930	31,390,000.00	
First Mortgage, R. & S. W. Railway, 4% Bonds	1936	857,000.00	
First Consolidated Mortgage, 5% Bonds	1939	29,858,000.00	
First Mortgage, Craig Valley Branch 5% Bonds	1940	650,000.00	
First Mortgage, Greenbrier Railway, 4% Bonds	1940	1,782,000.00	
First Mortgage, Warm Springs Branch, 5% Bonds	1941	400,000.00	
First Mortgage, Big Sandy Railway, 4% Bonds	1944	4,618,000.00	
First Mortgage, Paint Creek Branch, 4% Bonds	1945	539,000.00	
First Mortgage, Coal River Railway, 4% Bonds	1945	2,809,000.00	
Convertible 5% Secured Gold Bonds	1946	40,180,000.00	
First Mortgage, Potts Creek Branch, 4% Bonds	1946	600,000.00	
First Mortgage, Va. Air Line Railway, 5% Bonds	1952	900,000.00	
First Mortgage, R. & A. Division, 4% Bonds	1989	6,000,000.00	
Second Mortgage, R. & A. Division, 4% Bonds	1989	1,000,000.00	
General Mortgage, 4½% Bonds	1992	48,129,000.00	
			$173,552,000.00
Equipment Trust Obligations and Contracts			7,983,169.54
			$181,535,169.54
First Lien and Improvement Mortgage 5% Bonds (see Contra)	1930		47,265,000.00
			$291,597,169.54
Working Liabilities.			
Loans and Bills Payable		$95,000.00	
Traffic Balances		399,777.04	
Audited Vouchers and Pay Rolls		3,499,239.30	
Unpaid Wages		27,572.62	
Miscellaneous Accounts Payable		350,050.07	
Matured Interest and Dividends Unpaid		399,722.90	
Matured Mortgage and Secured Debt Unpaid		514,154.17	
Other Working Liabilities		67,960.40	
			$5,353,476.50
Deferred Liabilities.			
Unmatured Interest and Rents		$2,331,890.09	
Taxes Accrued		1,607,791.01	
Accrued Depreciation—Equipment		5,357,529.63	
Sundry Accounts		436,817.36	
			9,734,028.09
			$15,087,504.59
Appropriated Surplus.			
Additions to Property through Income since June 30, 1907		$2,984,365.23	
Reserve Invested in Sinking Funds		32,570.97	
Reserve Invested in Insurance Fund		59,319.04	
			$3,076,255.24
Profit and Loss—Balance			6,989,894.36
			$10,066,149.60
Total			$316,750,823.73

CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY—THIRTY-FIFTH ANNUAL REPORT

To the Stockholders of the Chicago, Saint Paul, Minneapolis and Omaha Railway Company:

The Board of Directors submit herewith their report of the operations and affairs of the Chicago, Saint Paul, Minneapolis and Omaha Railway Company for the fiscal year ending June 30, 1916.

Average number of miles operated, 1,752.81.

Operating Revenues:		
Freight	$12,860,214.17	
Passenger	5,191,440.62	
Other Transportation	1,142,835.68	
Incidental	328,072.10	
Total Operating Revenues		$19,522,562.57
Operating Expenses (66.38 per cent. of Operating Revenues)		12,958,837.50
Net Revenue from Railway Operations		$6,563,725.07
Railway Tax Accruals (5.23 per cent. of Operating Revenues)	$1,022,052.69	
Uncollectible Railway Revenues	6,336.98	1,028,389.67
Railway Operating Income		$5,535,335.40
Nonoperating Income:		
Rental Income	$357,852.35	
Dividend Income	46,351.00	
Income from Funded Securities	15,224.78	
Income from Unfunded Securities and Accounts, and other items	37,151.39	
Total Nonoperating Income		456,579.52
Gross Income		$5,991,914.92
Deductions from Gross Income:		
Rental Payments	$756,783.86	
Interest on Funded Debt	2,215,377.33	
Other Deductions	16,726.93	
Total Deductions from Gross Income		2,988,888.12
Net Income		$3,003,026.80

DISPOSITION OF NET INCOME:

Dividends—		
7% on Preferred Stock	$788,147.50	
7% on Common Stock	1,298,969.00	
		2,087,116.50
Balance Income for the year		$915,910.30

The results as compared with the preceding fiscal year were as follows:

Freight Revenue increased	$1,337,110.73	
Passenger Revenue increased	207,740.73	
Other Transportation Revenue increased	120,640.80	
Incidental Revenue increased	15,722.63	
Total Operating Revenues increased		$1,681,214.89
Operating Expenses increased	$851,239.99	
Railway Tax Accruals increased	7,024.08	
Uncollectible Railway Revenues increased	1,502.39	
		859,766.46
Railway Operating Income increased		$821,448.43

Of the Operating Expenses for the current fiscal year $7,204,098.51, or 55.59 per cent., was paid employees for labor, as compared with $6,599,357.35, or 54.51 per cent., paid during the preceding fiscal year. The increase of $604,741.16 in the amount paid is accounted for as follows:

Increase account more time worked	$513,928.22
Increase account higher rates of compensation	90,812.94
	$604,741.16

MILES OF RAILROAD.

The total number of miles of railroad owned June 30, 1916, was		1,683.22 miles
In addition to which the company operated:		
UNDER TRACKAGE RIGHTS—		
Northern Pacific Railway (Superior, Wis., to Rice's Point, Minn.)	1.59 miles	
Great Northern Railway (St. Paul to Minneapolis, Minn.)	11.40 "	
Minneapolis & St. Louis Railroad (Minneapolis to Merriam, Minn.)	27.00 "	
Illinois Central Railroad (LeMars to Sioux City, Iowa)	25.20 "	
Sioux City Bridge Company (bridge across Missouri River and tracks at Sioux City, Iowa)	3.90 "	
Chicago and North Western Railway (Sioux City to Sioux City Bridge Company's track)	.50 "	
	69.59 "	
Total miles of railroad operated June 30, 1916	1,752.81 "	

The above mileage is located as follows:

In Wisconsin	781.14 miles
In Minnesota	473.04 "
In Iowa	102.04 "
In South Dakota	88.20 "
In Nebraska	308.39 "
Total	1,752.81 "

In addition to the foregoing, the company owned and operated 183.03 miles of second track, located as follows:

In Wisconsin	157.09 miles
In Minnesota	24.23 "
In Nebraska	1.71 "
Total	183.03 "

FREIGHT TRAFFIC

The details of Freight Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	INCREASE Amount	INCREASE Per Cent.
FREIGHT REVENUE	$11,523,103.44	$12,860,214.17	$1,337,110.73	11.60

	1915	1916	Percentage of Increase or Decrease
TONS OF REVENUE FREIGHT CARRIED	8,794,488	10,082,061	14.64 Inc.
TONS OF REVENUE FREIGHT CARRIED ONE MILE	1,336,106,367	1,578,936,405	18.17 Inc.
AVERAGE REVENUE RECEIVED PER TON	$1.31	$1.28	2.29 Dec.
AVERAGE REVENUE RECEIVED PER TON PER MILE	.86 of a cent	.81 of a cent	5.81 Dec.
AVERAGE DISTANCE EACH REVENUE TON WAS HAULED	151.93 miles	156.61 miles	3.08 Inc.
MILEAGE OF FREIGHT AND MIXED TRAINS	4,026,069	4,449,389	10.51 Inc.
AVERAGE NUMBER OF TONS OF ALL FREIGHT CARRIED PER TRAIN MILE	360.13	390.31	8.38 Inc.
AVERAGE NUMBER OF TONS OF ALL FREIGHT CARRIED PER LOADED CAR MILE	20.39	21.30	4.46 Inc.
AVERAGE FREIGHT REVENUE PER TRAIN MILE	$2.86	$2.89	1.05 Inc.

PASSENGER TRAFFIC

The details of Passenger Traffic for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	INCREASE Amount	INCREASE Per Cent.
PASSENGER REVENUE	$4,983,699.89	$5,191,440.62	$207,740.73	4.17

	1915	1916	Percentage of Increase or Decrease
PASSENGERS CARRIED	4,767,826	5,436,588	14.03 Inc.
PASSENGERS CARRIED ONE MILE	252,305,000	254,754,659	.97 Inc.
AVERAGE FARE PAID PER PASSENGER	104.53 cents	95.49 cents	3.19 Inc.
AVERAGE RATE PAID PER PASSENGER PER MILE	1.975 cents	2.038 cents	3.19 Inc.
AVERAGE DISTANCE TRAVELED PER PASSENGER	52.92 miles	46.86 miles	11.45 Dec.
MILEAGE OF REVENUE PASSENGER AND MIXED TRAINS	4,349,764	4,404,103	1.25 Inc.
AVERAGE PASSENGER TRAIN REVENUE PER TRAIN MILE	$1.34	$1.40	4.48 Inc.

MAINTENANCE OF WAY AND STRUCTURES

The total Operating Expenses of the Company for the year ending June 30, 1916, were $12,958,837.50; of this amount $2,340,883.41 was for charges pertaining to Maintenance of Way and Structures. Included in these charges are $124,506.88 for steel rails, $350,986.75 for ties, and the cost of re-ballasting 112.11 miles with gravel and cinders, also part cost of replacing 2,664 feet of wooden bridging with permanent work.

During the year 6,424 tons of new steel rails and 8,605 tons of usable and re-rolled steel rails were laid in track, a greater portion of which replaced rails of lighter weight; 671,654 ties of all descriptions were laid in renewals.

The details of the charges to Maintenance of Way and Structures for the year, compared with the previous year, were as follows:

	1915	1916	Increase or Decrease
COST OF RAILS:			
New steel rails	$362,580.63	$203,432.82	$159,147.81 Dec.
Usable and re-rolled rails	138,315.69	229,051.76	90,736.07 Inc.
Less value of old rails and other items	$500,896.32 369,953.94	$432,484.58 307,977.70	$68,411.74 Dec. 61,976.24 Dec.
Net charge for rails	$130,942.38	$124,506.88	$ 6,435.50 Dec.
COST OF TIES	229,376.56	350,986.75	121,610.19 Inc.
COST OF BALLAST	20,270.06	17,970.71	2,299.35 Dec.
COST OF OTHER TRACK MATERIAL	117,233.06	122,156.44	4,923.38 Inc.
ROADWAY AND TRACK LABOR AND OTHER EXPENSES	774,745.18	781,740.35	6,995.17 Inc.
Total Charges for Roadway and Track	$1,272,567.24	$1,397,361.13	$124,793.89 Inc.
Other Charges Account Maintenance of Way and Structures were as follows:			
BRIDGES, TRESTLES AND CULVERTS	159,950.88	374,012.22	214,061.34 Inc.
ROAD CROSSINGS, FENCES, ETC.	64,003.35	73,771.69	9,768.34 Inc.
SIGNALS AND INTERLOCKING PLANTS	28,082.14	24,269.38	3,812.76 Dec.
BUILDINGS, FIXTURES AND GROUNDS	207,458.28	263,795.65	56,337.37 Inc.
DOCKS AND WHARVES	Cr. 96.30	1,523.02	1,619.32 Inc.
SUPERINTENDENCE	107,451.21	110,132.92	2,681.71 Inc.
ROADWAY TOOLS AND SUPPLIES	24,502.41	30,498.01	5,995.60 Inc.
SUNDRY MISCELLANEOUS CHARGES	92,884.28	65,519.39	27,364.89 Dec.
Total Charges Account Maintenance of Way and Structures	$1,956,803.49	$2,340,883.41	$384,079.92 Inc.

The above charges for Maintenance of Way and Structures for the current year amount to 18.06 per cent. of the total Operating Expenses, as compared with 16.16 per cent. for the preceding fiscal year.

MAINTENANCE OF EQUIPMENT.

The charges on account of Maintenance of Equipment for the year ending June 30, 1916, compared with the preceding year, were as follows:

	1915	1916	Increase or Decrease
LOCOMOTIVES	$975,126.79	$1,000,517.91	$ 25,391.12 Inc.
FREIGHT-TRAIN CARS	1,061,967.59	977,559.14	84,408.45 Dec.
PASSENGER-TRAIN CARS	265,800.71	245,929.07	19,871.64 Dec.
WORK EQUIPMENT	35,127.09	50,937.54	15,810.45 Inc.
SHOP MACHINERY AND TOOLS	31,300.56	32,680.20	1,379.64 Inc.
SUPERINTENDENCE	68,929.43	66,772.19	2,157.24 Dec.
SUNDRY MISCELLANEOUS CHARGES	38,704.54	44,741.24	6,036.70 Inc.
Total Charges Account Maintenance of Equipment	$2,476,956.71	$2,419,137.29	$57,819.42 Dec.

The above charges for Maintenance of Equipment for the current year amount to 18.67 per cent. of the total Operating Expenses, as compared with 20.46 per cent. for the preceding fiscal year.

RESERVE FOR ACCRUED DEPRECIATION ON EQUIPMENT

At the close of the preceding fiscal year there was a balance to the credit of the Equipment Reserve Accounts of	$1,912,783.32
During the year ending June 30, 1916, there was credited to the Equipment Reserve Accounts on account of charges to Operating Expenses for Accrued Depreciation	465,420.52
	$2,378,203.84
And there was charged during the year against the above amount the Accrued Depreciation previously credited this account on Equipment retired or transferred from one class of service to another	84,336.62
Leaving a balance to the credit of the Equipment Reserve Accounts on June 30, 1916, of	$2,293,867.22

TRANSPORTATION EXPENSES

The Transportation Expenses of the Company for the year were $7,208,270.51, or 55.62 per cent. of the total Operating Expenses. Of this amount $4,019,860.36, or 55.77 per cent., was for labor; $2,157,988.19, or 29.94 per cent., was for fuel for locomotives; and $1,030,421.96, or 14.29 per cent., was for supplies and miscellaneous items.

The total increase in the charges as compared with the preceding year was $470,573.34, distributed as follows:

Increase in amount charged for labor	$380,085.51
Increase in amount charged for fuel for locomotives	235,523.54
Decrease in amount charged for supplies and miscellaneous items	145,035.71
	$470,573.34

By order the Board of Directors.

JAMES T. CLARK,
President.